THE VISUAL DESIGN OF

SONIC THE HEDGEHOG

ソニック・ザ・ヘッジホッグ

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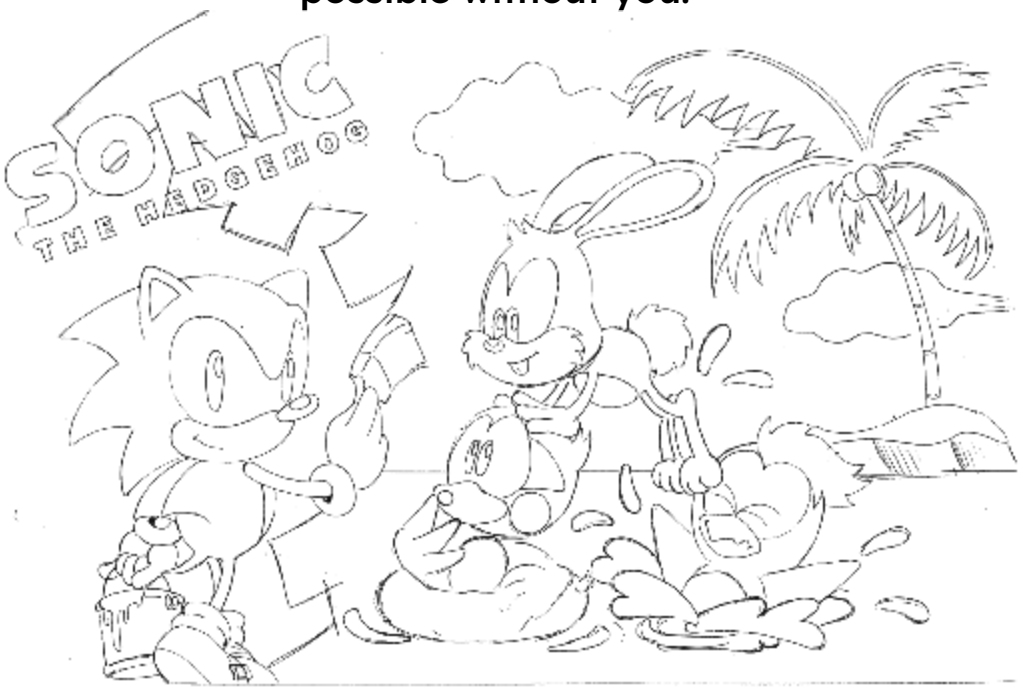
We'd also like to thank our numerous peers in discussion as fans, critics, and artists. Even without your direct involvement, writing this would not be possible without you.



Synopsis and Disclaimers

This document was written to be an accessible resource of contextual information about the character design of the SONIC THE HEDGEHOG franchise.

It is meant to provide a thorough context of how these designs are so unique and cool in the first place, and how that context relates to practices in depicting them well.

Later on, this context will also be used to explain how and why certain depictions of these characters are less liked than others.

This document is meant to inform and potentially inspire any artist who is willing to use this context, to support their own future innovations and push them further.

NO WAY! NO WAY! NO WAY!

It is NOT meant to restrain the originality of any person.

It is NOT meant to insult the artistic ability or work of any person.

It is NOT meant to suggest that SONIC characters should only be depicted in a single way.

We also are aware that Sonic Team and SEGA have intentionally avoided some of these creative choices. The intention of this document is mainly as a critique and research piece.

Oftentimes, conventional wisdom, advice, and ideas are often recited and shared without the context of how and why they are true or practical, simply because it is inconvenient or impossible to explain that context quickly.

Many parts of this document will address “simple”, “common”, or otherwise overlooked ideas, which may seem redundant, excessive, or even ridiculous. We have written it this way to contextualize and explain as thoroughly as possible, to avoid miscommunication and confusion.

We ask that you please be patient as you read.

If what an artist wants to achieve is to evolve further beyond the status quo of generic art, the most fundamental aspect of their progress is regarding rules. If for example a beginner artist wants to imitate the appeal of a game like “Sonic The Hedgehog” to make their own version of it or something inspired by it, first the rules behind how it works need to be understood. Rules in art exist to create coherence and thematic uniqueness through referencing research and history.

This document is meant to inspire creativity as much as it is meant to create a standard of what Sonic is at its best, and how deviations can make it better or worse depending on execution.

This statement also means that our team will be looking thoroughly at all versions of Sonic to talk properly about the dense history of changes and aesthetic incoherences that lead to lesser visual appeal.

To first understand the idea of this document, first one must understand what are the motivating aspects behind what makes art and games special. We sincerely hope readers turn into true masters of their craft through this research.

PART 0 - Motivation

How is it even possible to define "good" or "bad" art of an existing character?

If you are a practiced artist, but you still feel like your art isn't satisfying to you or is "bad", it can feel frustrating trying to figure out how you could make something satisfying or "good". There is a way to think about this.
To understand any character's design, you have to observe the character in the perspective of the artist that created them in the first place, and determine what their goals are.

When an artist creates something that does not exist, every single piece of that creation represents a conscious or unconscious decision to resemble something that does exist.

This process of decisions is why we use the word "design", a word that also means "plan", to refer to many things in the arts, even if they may appear to not be very deliberate.

Art that is "truly original" or unique is not a mysterious, unexplainable force of nature: It is created when an artist has pondered thoroughly about different and unobvious ways to relate together a wide variety of their own experiences and knowledge, and existing works by other artists, when creating new things.

It requires a lot of knowledge, focus, and practice to pay attention to details that can create these unobvious connections. However, their focus and attention is naturally biased by emotions, and so, what an artist connects together is ultimately driven by emotion.

That is why we say art is full of love.

This mixture of deep thought and emotional bias is also why we use the word "philosophy" to describe an artist's tendencies when thinking and making decisions in art. It is how art can be full of "rules" despite being an expression of the artist.

Thus, the phrase “design philosophy” of the character designers on an artistic series like Sonic refers to a combination of two things:

1. The “inspiration” (or “materials”):
   The works of other artists before them and the occurrences in the real world that the character designers hold dear to ponder about. When thinking of a character “design” as a “plan”, this would be the “tools” or “materials”.

2. The “theme” (or “purpose”):
   The feelings and ideas that the character designers use to connect the inspirations in their head. When thinking of character “design” as a “plan”, this would be the “purpose” that you give every “tool”.

Part 1 - Inspiration

「アメリカン的、カートン・キャラクターを日本のアニメーション技術・演出・動き等によって、よりスピード感・爽快感を追求する。これはアメリカと日本の融合であり、新しい試みではないでしょうか。」

“An American cartoon character using Japanese animation techniques, acting and direction to pursue a thrilling experience of speed. This will be a fusion of American and Japanese animation, it seems... It’s a new experiment and initiative, isn’t it?"

Unknown author, *SONIC THE HEDGEHOG CD animation concept art.*

Concept art made for Sonic The Hedgehog CD’s animation production.

Unknown Author.

So, what is the design philosophy of SONIC THE HEDGEHOG?
While direct quotations from artists are useful, we can also observe official works to identify common traits between them.

SONIC THE HEDGEHOG’s visual aesthetic originated as a combination of:

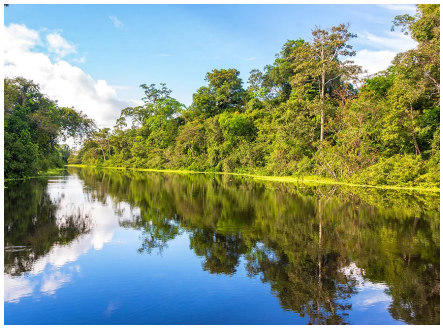
- American golden age cartoons from the 1920s, 1930s 1940s, and 1950s
- Japanese golden era of animation and comic books of the 1970s and 1980s,
- 3D computer graphics from the 1980s depicting surreal fantasies,
- Attitudes, experiences, and perspectives of youth.
- Pop culture in both Japan and America, such as street fashion and graffiti.
- Iconic scenery of nature, ancient civilizations and modern cities around the world.
- Memories from the innocent childhood sense of adventure.

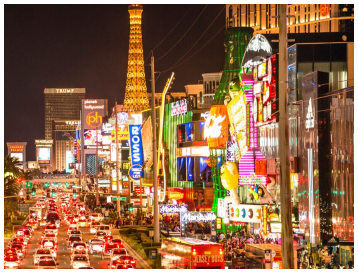
A childhood sense of wonder is the main inspiration behind any art that wants to get people intrigued. Art itself is made of intrigue and the most curious and willing to go on adventures of the unknown are children. It’s the reason why most fond memories are of an innocent sense of discovering the world and its intricacies as a child. Most of Sonic’s staff all describe childhood memories with media, their lives and memorable experiences when young as a source of inspiration.

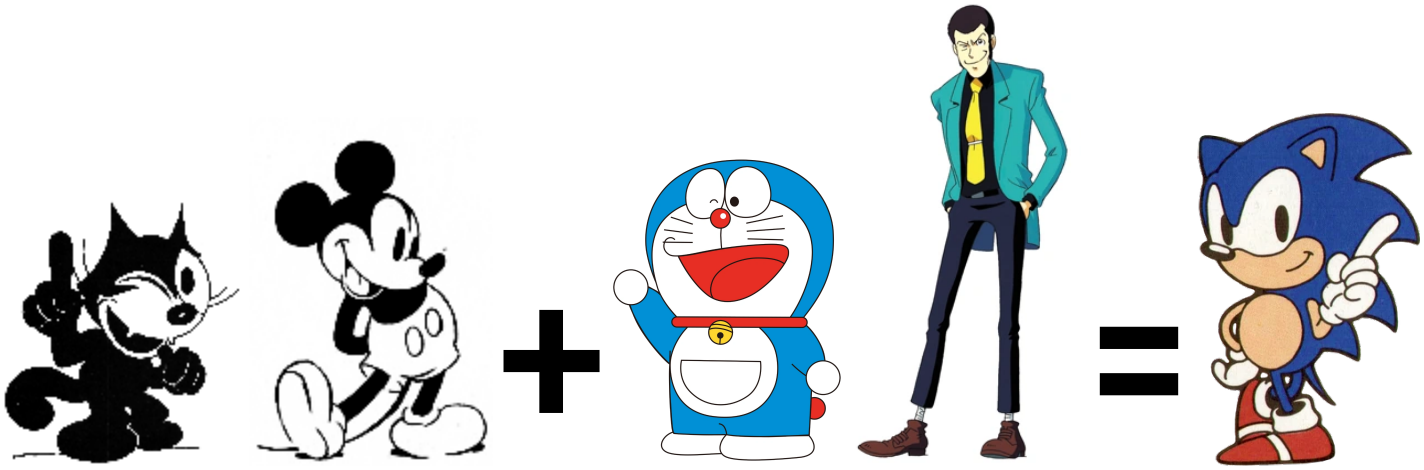
You first need to put others before yourself and understand why you like what you like, and why you are who you are when being inspired by anything in life. To know art is to know yourself, and to know yourself, you need to love.

When you love yourself, only then you can give this same love to others.

“The love you take is equal to the love you make” - Paul McCartney,The End. Album, Abbey Road.







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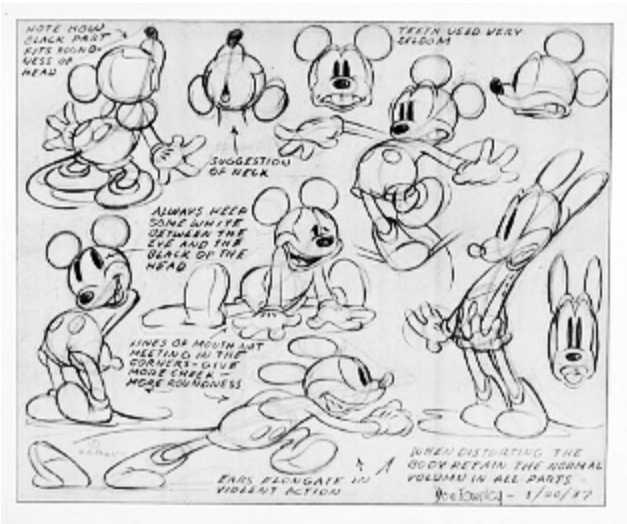
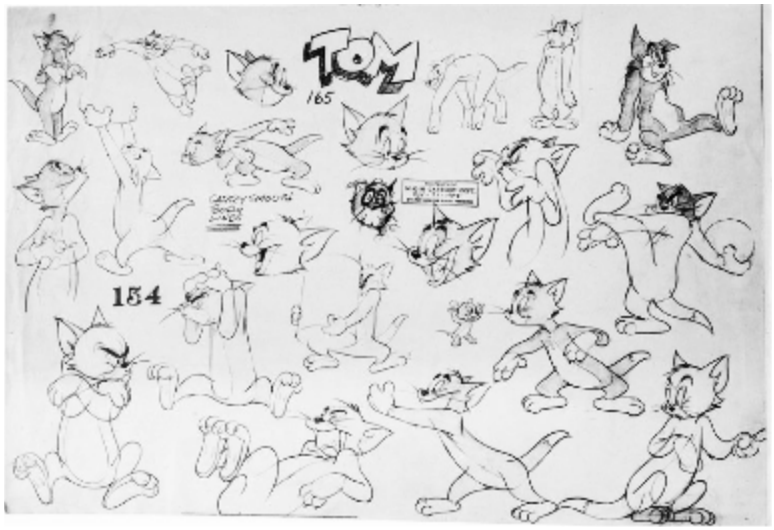
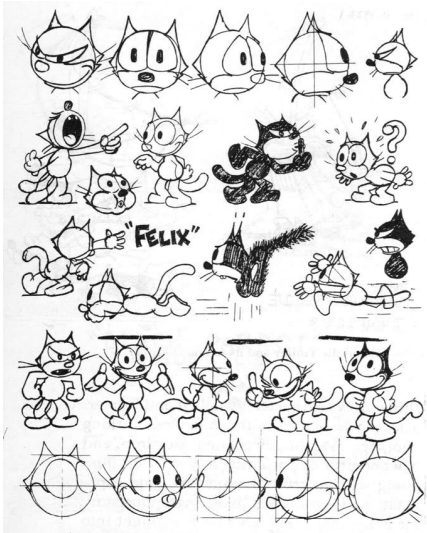
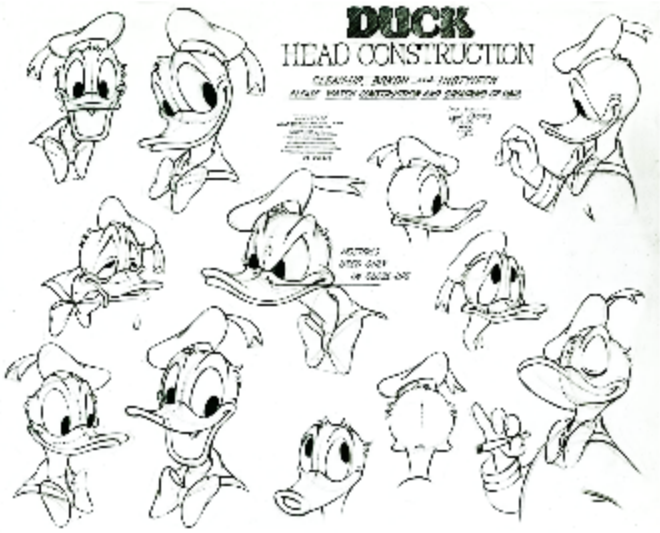
Golden Age of Animation in the West 1920s to 1960s







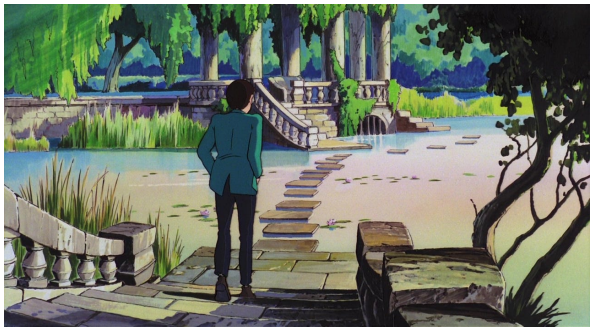


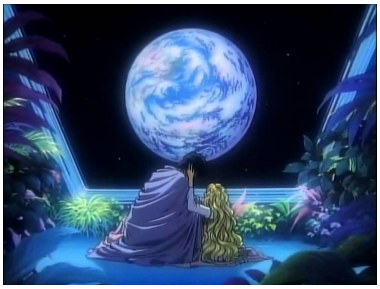
It is a rather well known fact that Sonic characters were inspired by the golden age of animation. This is not to say they are strictly made to act like a character like Mickey per say, as they have their own unique characteristics, but that without referencing characters like “Mickey Mouse”, “Donald Duck”, “Tom and Jerry” and “Felix the Cat”, the Sonic series wouldn’t have its main characteristic factor about it which is how the characters are presented in a classic western style and influenced by classic folk and fairy tales that themselves made up much of the golden age’s output.

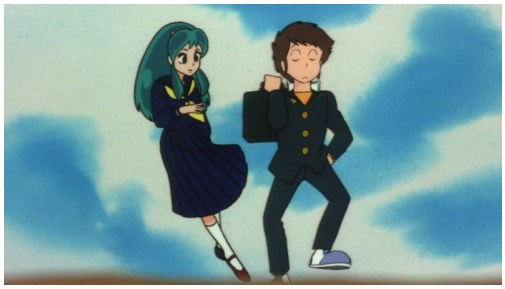
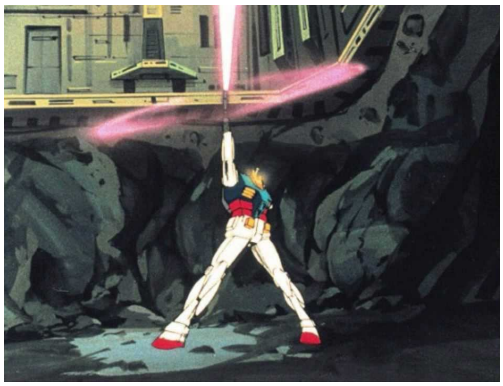
Manga 1970s to 1990s

Manga most definitely had an influence on Sonic from just about every aspect according to research. Popular manga artists like Go Nagai, Rumiko Takahashi, Monkey Punch, Shotaro Ishinomori, Osamu Tezuka and Akira Toriyama were definitely a foundation for what the series would aim towards thematically. Manga started as a way to bring the cartooning aspects of popular western golden era cartoons and mix it with the popular styles of Japanese writing. This means that although there would be cartoon characters doing cartoon character antics, the themes and writing would have more mature topics despite being approached in goofy ways by the author. It’s a blend of comedy and realism of day to day life that clashes and creates a world where the characters are grounded in their cartoon exaggerated reality while reacting to it in a more realistic human way. This is the basis for how humour and drama work in manga, which later made its way into animation and live action, and evolved presentation wise into a different medium to continue doing this but with more visual intrigue. Series like Astro Boy, Lupin the Third, Mazinger Z, Dr Slump and Urusei Yatsura and main highlights, although there are many more references out there to manga from that time period.
It all takes advantage of dream-like scenarios with exaggerated characters that are often viewed as one offs for comedy that offer a lot more complexity than the simple pun they appear to be.

Golden Age of Japanese Animation 1970s to 1990s

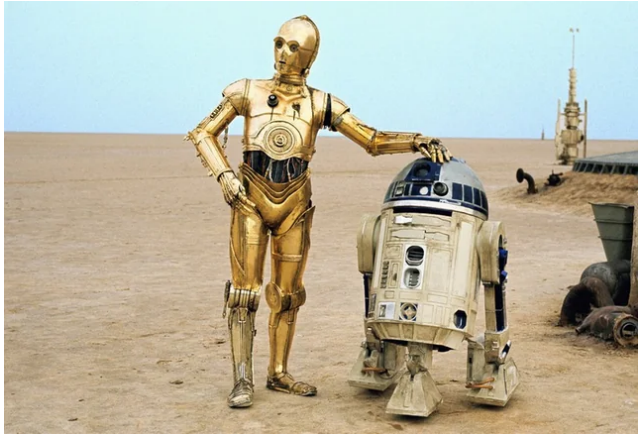




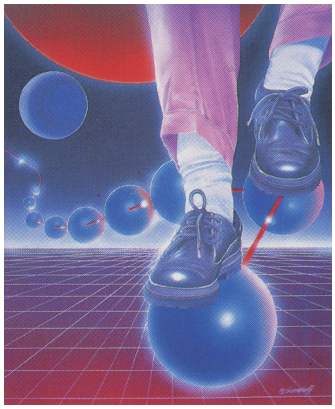
Sonic was made in Japan and is part of a bigger group of japanese animation as a whole. Due to this, it would be ridiculous to say Sonic isn't "Anime". Sonic's entire foundation from its inception to what the finalized version turned into is nothing short of incredibly inspired by various animated OVAs, Movies and TV series. Urusei Yatsura (1981) is a constant attempt to take the very simple romcom ideas from the original manga to just elevate it to something aesthetically more dream-like and surreal to match the surrealistic comedy of the manga. Lupin the Third has influence from western gag oriented animation mixed in with influences from Japanese storywriting, which Sonic took high influence from. Works of Japanese animation legends like Takahata and Miyazaki such as "The Castle in the Sky", "Panda, Go Panda!", "Lupin III: The Castle Of Cagliostro" and "Porco Rosso" clearly show influence for many Sonic games from old to new. Popular mecha series like "Mobile Suit Gundam", "Patlabor", "Layzner", "Votoms" and the many works of Yoshiyuki Tomino influenced robot design and themes. Sonic is inherently anime.

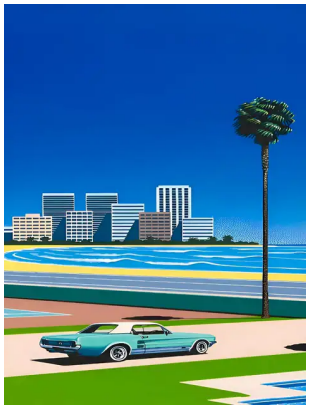
Popular Series in Japan



We often underestimate how much of the popular culture from around us influences the things we create. With Sonic it is not different, many things from the timeframe of the creators childhood and young adulthood were core experiences towards creating what Sonic turned into. These range from Tokusatsu to Western popular media that was crossing itself over into Japanese pop culture. Series like “Godzilla”, “Kamen Rider”, “Star Wars”, “Star Trek”, “Thunderbirds”, “Robocon”. These are generally uncategorized for the sake of explaining how sometimes, even the most random of things can spark inspiration. To understand the author, first you must understand his background, as not everything that comes to artists comes from the conscious.

Sleek and Cartoon Airbrush





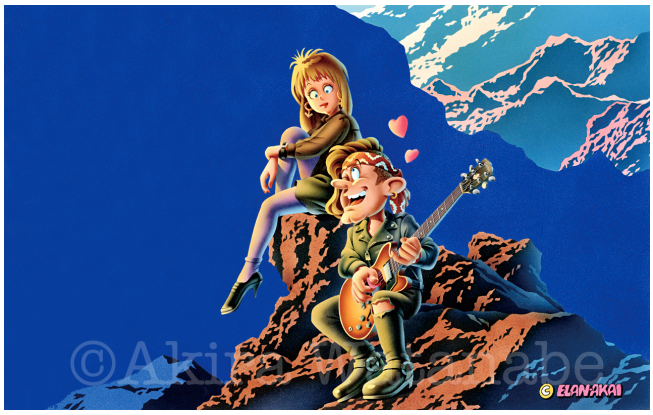


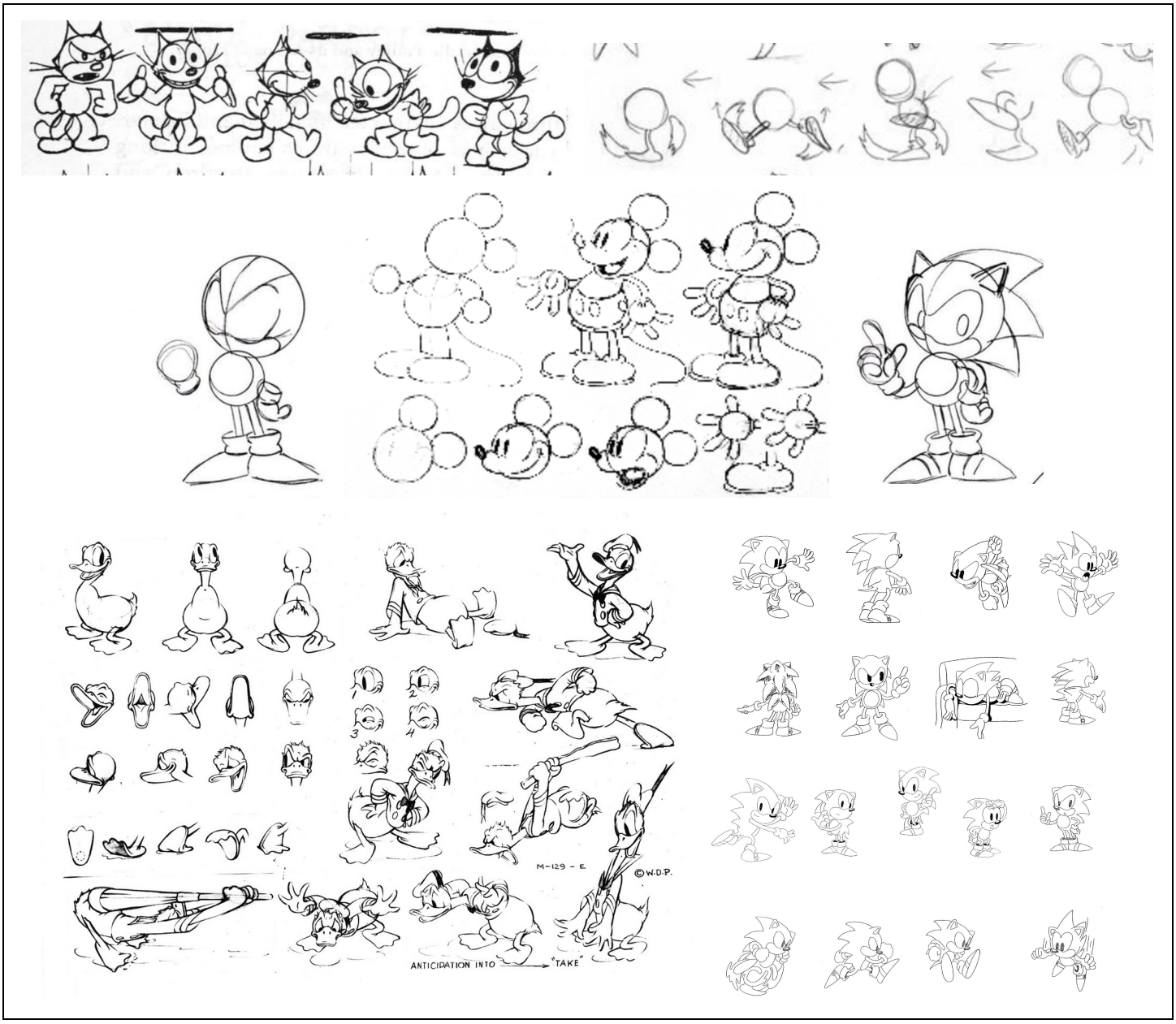
Illustration by Akira Watanabe

The two major styles of airbrush artwork popular in Japan during the time of Sonic's creation both heavily influenced the look of Sonic's classic airbrush style used in the 90s. With the widespread "Sleek" shiny CGI inspired look (often accompanied by chrome, cars and californian beaches) being used as the basis for Sonic's world presentation alongside "Retrofurtism" airbrush pieces of a similar vein, with a key artist of this style being Hiroshi Nagai, known for his famous "City Pop" art and the widely popular Eijin Suzuki.
The "Cartoon" style of artwork made in Japan was used as the basis for how characters were rendered in key art. The two key artists of the airbrush look were *Sumusumu Matsushita*, who popularized the cartoon airbrush look in Japan to begin with as well as *Akira Watanabe* who excelled at both styles and would later be the main airbrush artist during the Classic Sonic era of the 90s.

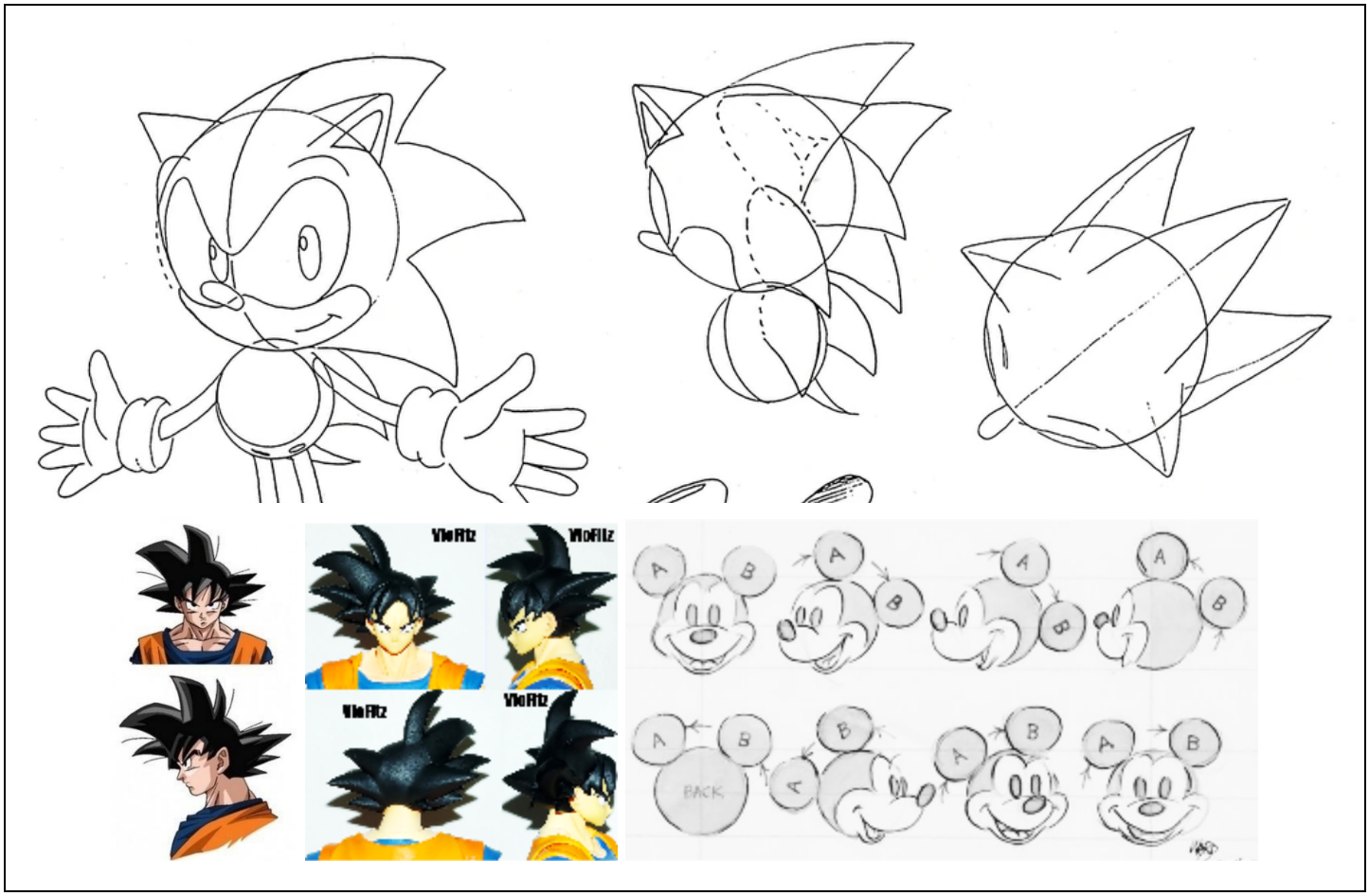
Inspirational Conclusion:

Many of the ideas that make SONIC THE HEDGEHOG so intensely identifiable and cool come from these inspirations and exaggerating them. Even as SONIC TEAM's cultural inspirations changed with the times and with members joining or leaving the company, the values that were born from these specific inspirations would persist for very, very long:

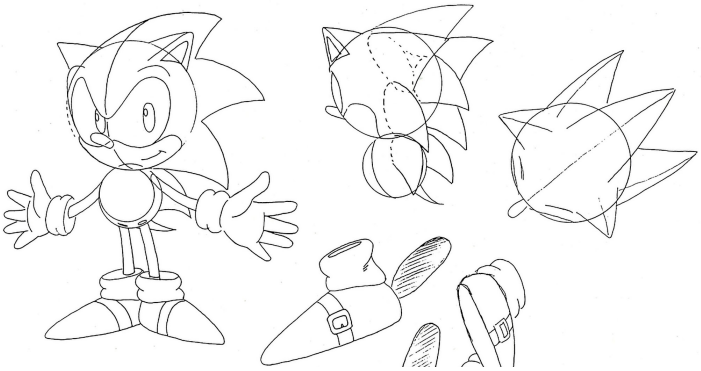
1. **Characters' bodies are made from elaborate arrangements of simple, replicable 3D shapes, and these shapes are easily identifiable. Additionally, corners and edges have a clear definition.**

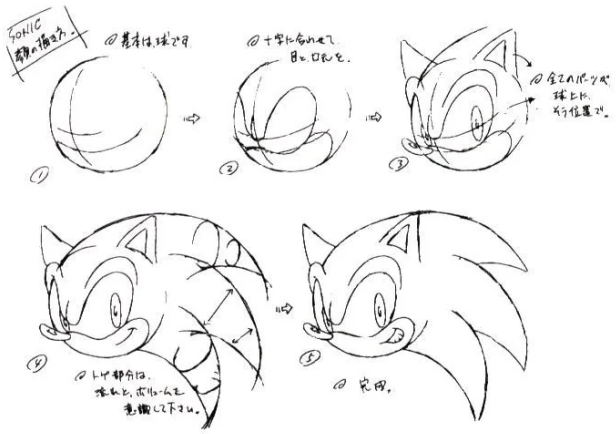


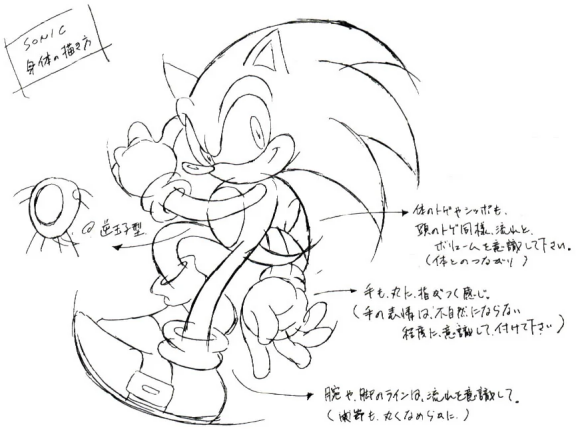
2. The silhouette of a character is extremely recognizable, regardless of the 3D direction that the character is facing: In fact, it may even inform the viewer about what that 3D direction is.



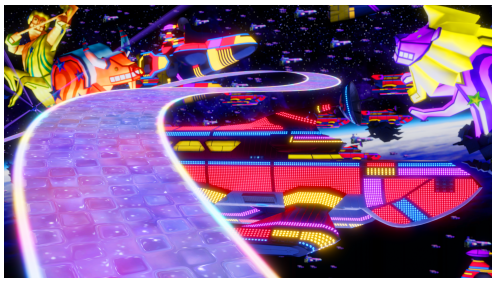
3. The shapes of characters align with themselves harmoniously between the character’s design and personality. Shape language is key.





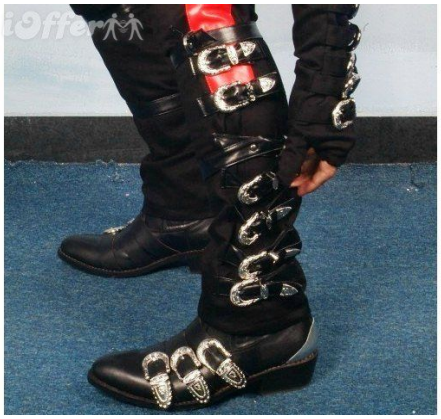


4. Characters and environments use bright colors, and highlights & shadows are rendered with exaggerated contrast.



5. All Characters' faces are simplistic and "cute" looking when resting, but extremely flexible to display a wide array of human emotions.

6. Clothes worn by the characters are simplified, fantasy versions of clothes that already exist in the real world. These clothes are very particularly chosen to subtly explain the personality of the characters.



In the next few sections, we will go into further detail on the creative process behind these choices. We guarantee that any creator who wants to use these references, will fully understand how to properly use these inspirations as a guideline until the end of the document.

2.1 - The Hedgehog

The first interesting thing to note about Sonic The Hedgehog in comparison to the American mascots that inspired him, is the very particular choice of a hedgehog. The series very frequently selects very peculiar animals based on visual iconography, references to mythology, or certain behaviors that would be interesting to translate into game mechanics; The selection of a hedgehog is the beginning of this pattern.

Character Acting wise, Sonic Team created “Sonic The Hedgehog” first thinking about the gameplay aspect, only to then make a character that fit the gameplay idea. They wanted a fast paced “action platformer game to challenge Mario”.

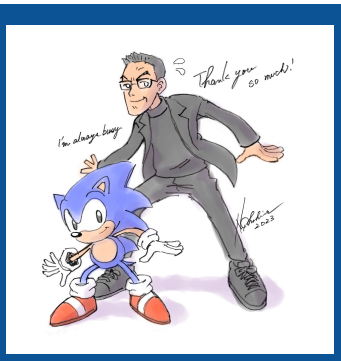
“In the beginning it was just a program where you moved a ball-like object around, then at some point it was a rabbit”

“Ultimately we decided to give the character a somersault attack. That idea actually came from a notebook I had in high school, scribbled there on the very last page.”

Yuji Naka in an interview

It was the work of the incredible designers at Sonic Team who made Sonic as we know it come to life, such as Naoto Ohshima and Hirokazu Yasuhara and Yasushi Yamaguchi.

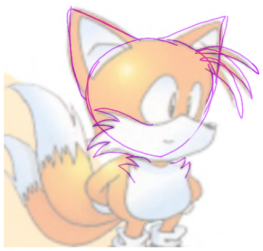
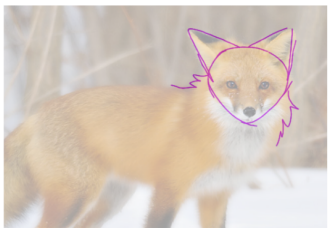
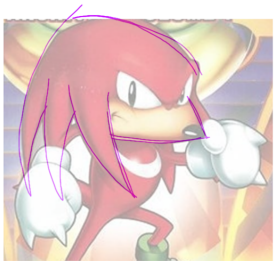
“We wanted a character kids could draw,” Oshima said, a cartoon animal on par with Mickey Mouse, Felix the Cat or Doraemon. The team wanted their new mascot to be instinctively familiar, almost instantly recognizable and affectionate.”

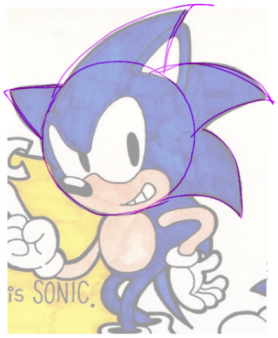


Naoto Ohshima in a GDC interview

In order to make this work, the team first had to work out abstractions of what the cartoon hedgehog could look like to create a great remarkable character, whether story wise or visually. In design theory this concept is called “Ornamenting” because it's essentially decorating and creating a story to make something ordinary special. A big part of this starts through abstraction.

Hedgehogs have very cute round bodies, small vertical feet, small hands, and small cone shaped ears, and spiky backs. Despite not seeming that way at first glance, most of the characters share similar shape language as their animal counterparts with the only difference being hyper-stylization. For example, hedgehogs when broken down are basically a circle with many triangles, much like SONIC. Foxes are simultaneously angular but fluffy, giving them a level of cuteness factor, much like TAILS. Echidnas are not only almond shaped but are also incredibly sharp looking, much like KNUCKLES.

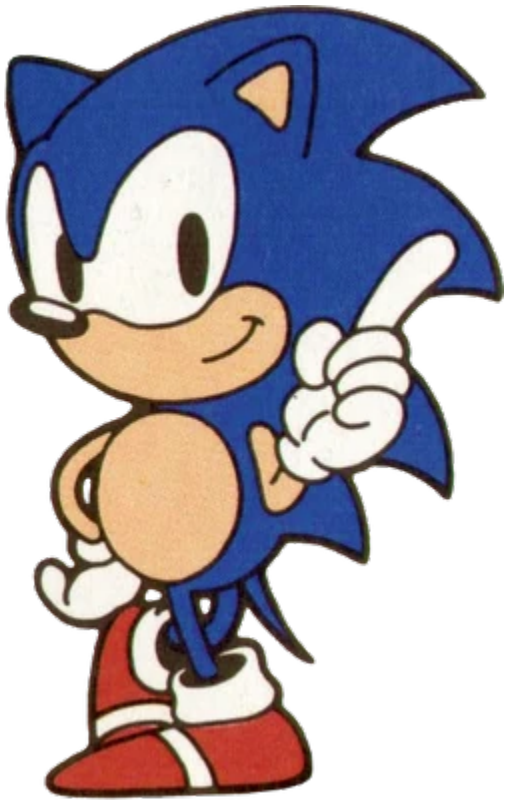


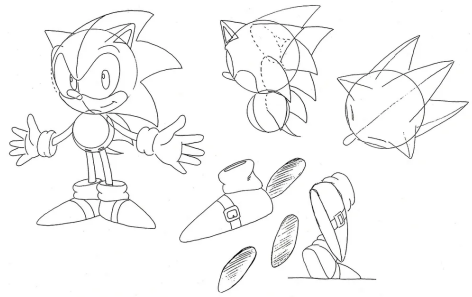
Images taken from:

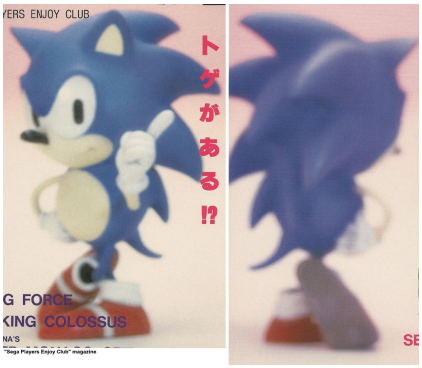
Cyborg 009, Black Jack, Urusei Yatsura, Mazinger Z, Ashita No Joe.

In a lot of classic anime and manga, characters often had spiky, flowing hair as a symbol of being a loner: A person with a very unique counter-cultural attitude that leads them to wander as an outsider, looking for purpose or adventure. It's common knowledge that the Sonic series visually is pretty much a fusion of classic 1930's cartoons and 70's-90's anime/OVAs/manga/movies.

The quills of a hedgehog became the spiky hair of a passionate young rebel wielding a surprising sense of wisdom.







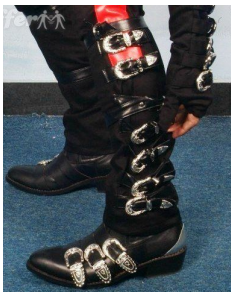
To create a SONIC that could appeal to 3D and to simplistic shapes, the spikes were designated to be 6 in total, distributed across 2 rows of 3: The middle column was slightly raised to fuse the upper spike smoothly into his forehead and create the iconic silhouette.

The cute roundness of the hedgehog and the bright fur on its underside and snout was simplified into a spherical torso and a spherical skull with skin-toned patterns. Because the pattern on his belly is a circle being printed onto a sphere, it also acts as an elegant 3D “compass” of direction.

His feet and ears are bisected cones which were smoothed out so it looks cuter.

Some unknown quantity of real, physical figures were commissioned in 1990 to solidify the final design of the character, as can be seen to the left. Even if there are differences to the 2D artwork, the base shapes and features are maintained intact. That is how appeal is maintained no matter interpretation.

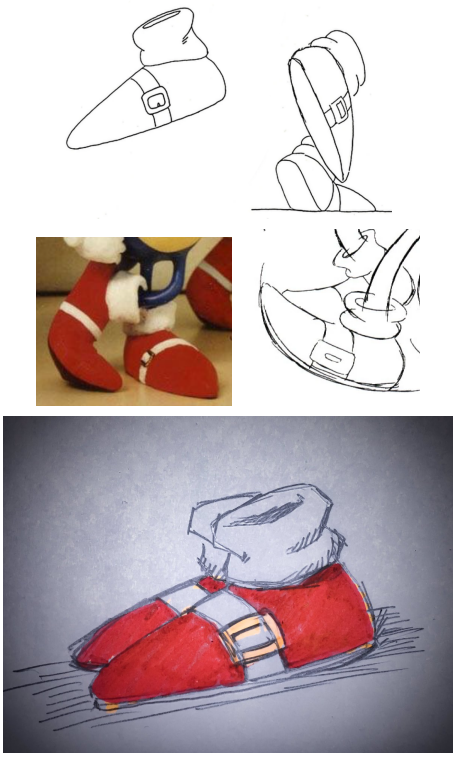
You may notice that, while a particular viewing angle is the most famous of them all, this arrangement of 6 quills creates a very distinct set of silhouettes that can be recognized instantly, and these silhouettes were consistently respected when depicting him during the lifespan of the SEGA MEGA-DRIVE (GENESIS) and SEGA SATURN.



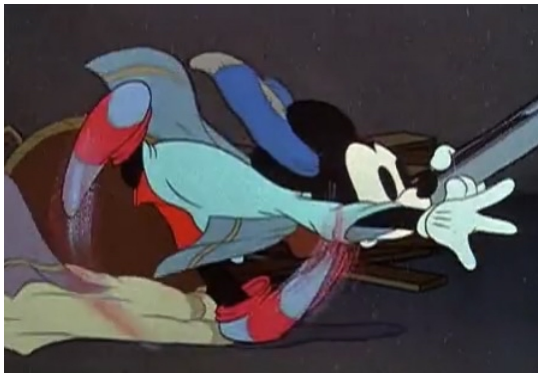
To continue the theme of counter-cultural youth, Sonic wore red leather boots with the neck of the boot folded and rolled over to expose the white underside of the fabric.

You would normally expect an athletic character to wear clothes designed to make athletic or laborious tasks easier, but Sonic is the kind of man who would prioritize his own sense of fashion:

Naoto Ohshima has stated that the specific choice of a leather boot being fastened with a belt and buckle was



inspired by Michael Jackson and the character costume that Michael wore to promote the "Bad" album (1987), making it quite clear that the boot is meant to be distinguished, rebellious fashion. While the color scheme and general construction is inspired by Santa Claus and the type of shoes worn by him.

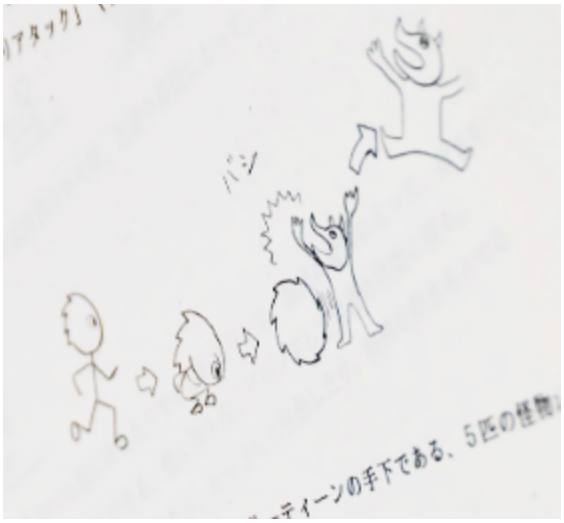


The boot was simplified into a red bisected cone or a triangle, with a yellow square buckle overlapping a white stripe strap. This simplification is likely inspired by the 1938 short, "Mickey's Parrot" where the titular Mickey Mouse can be seen running in slippers with a similar folded cuff and center striped design with stretching / blurring to emphasize movement and speed. All things Sonic would of course take after.

It's Boots" - Naoto Ohshima on Twitter

As mentioned, the first thing they came up with for the original Sonic The Hedgehog was that he would roll into a ball, before even the character design was finalized. As such it is one of the most important aspects of the character acting.

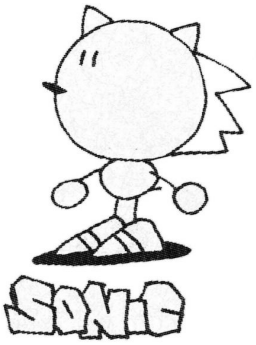
These ideas for motion were later further refined in the form of animation in the opening of Sonic CD as a clear representation of how the motion works. Sonic is very agile on foot, using a parkour-esque maneuver but a lot heavier in ball form, turning him into a pinball that can somewhat stick to terrain. Sonic's personality came first from how the gameplay worked.



"In the beginning, the one and only idea we had for Sonic was "speed. But as the development went on, we came up with the idea of his somersault attack, and added in the pinball-style movement to the game you see today."

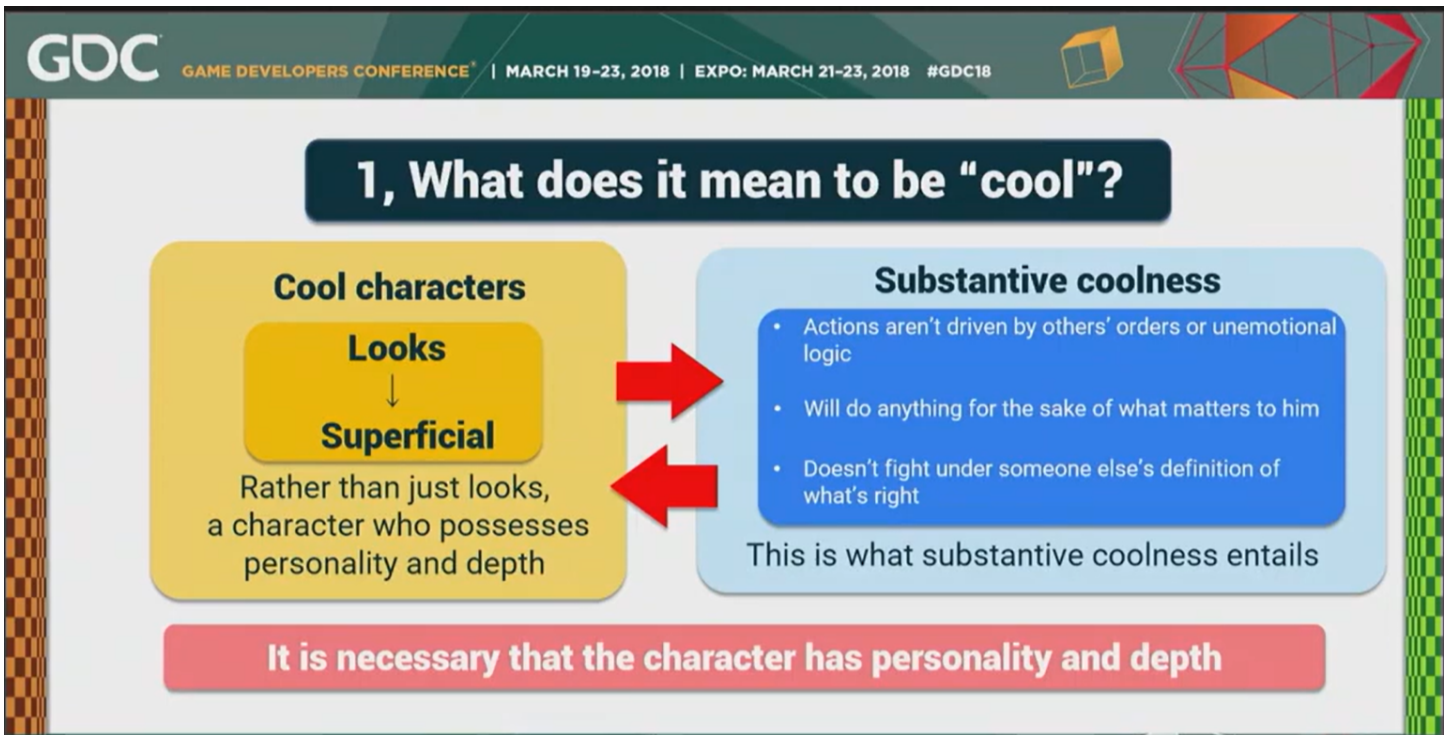
Naoto Ohshima in an interview

Sonic's entire character was built on duality for gameplay, so it only made sense for the character acting to also be based on this. Sonic has a soft, humanitarian and somewhat shy, and a determined and somewhat easily irritated impulsive side. This was largely through the influence of Hirokazu Yasuhara during development.

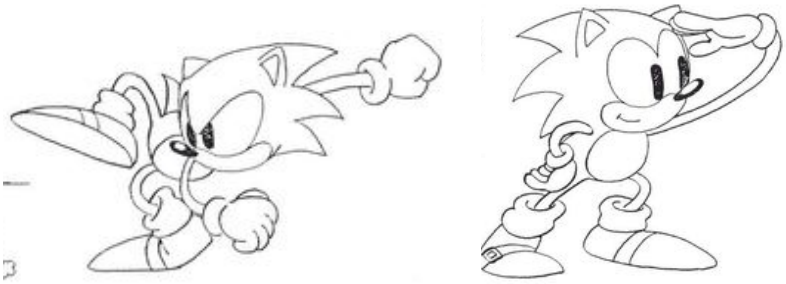


According to Hirokazu Yasuhara *in a GDC interview* for something to be cool, it can't just look superficially cool. "Rather than just looking cool, it is necessary that the character has personality and depth." This meant a somewhat rebellious yet righteous nature to the character where his actions aren't driven by others orders of unemotional logic, that the character will do anything for the sake of what matters to him and that it doesn't fight under someone else's definition of what's right.

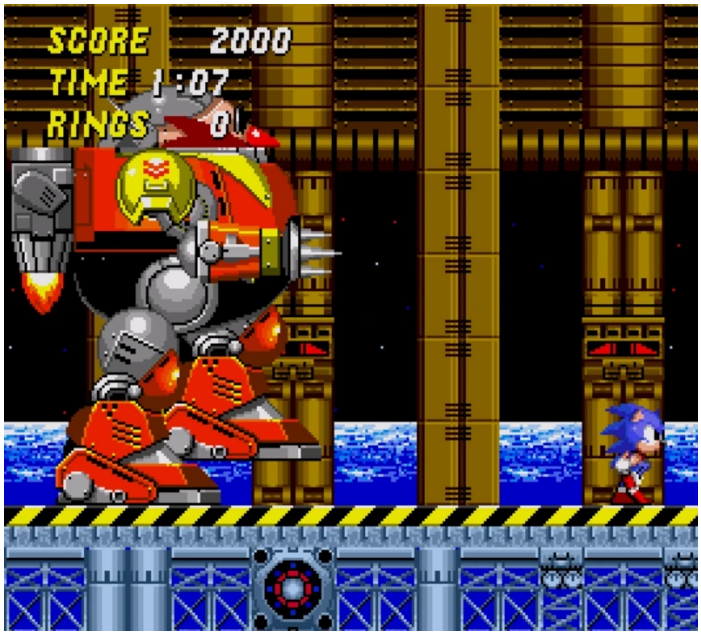
It is necessary that the character has personality and depth

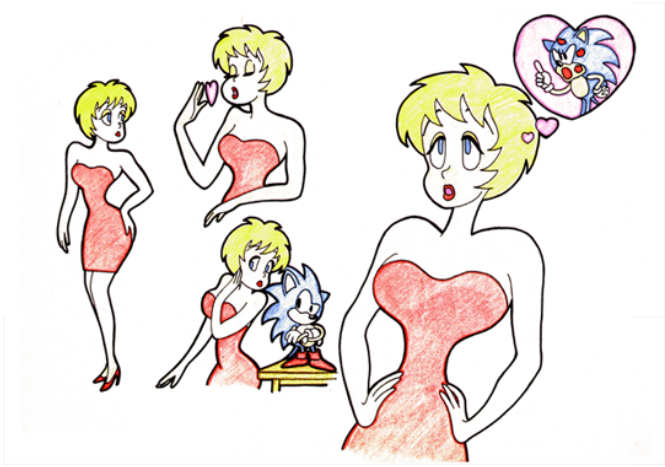


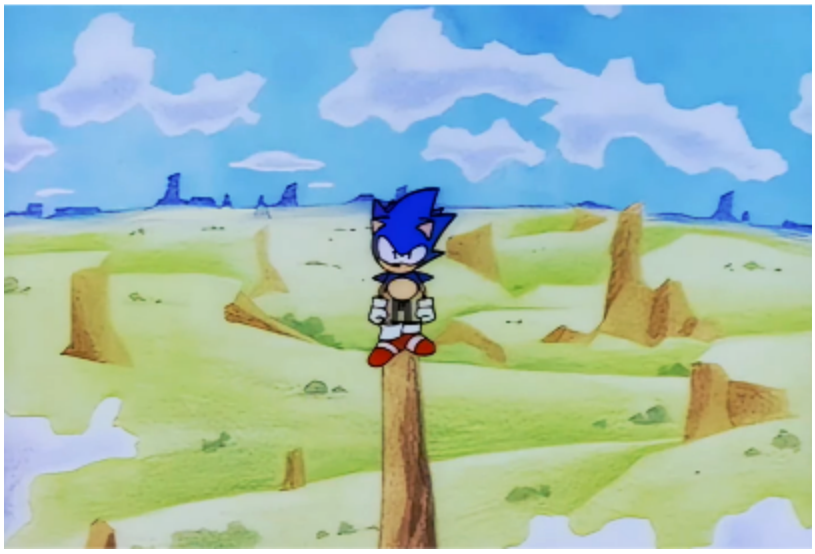
As such, we have what we now know as "Sonic The Hedgehog". A character built on not just being what it appears to be through having depth to how he acts, to how he looks and how the world around him is presented. A character capable of surpassing the initial cute mascot expectation through the depth of his attitude, which is reflected on animation.



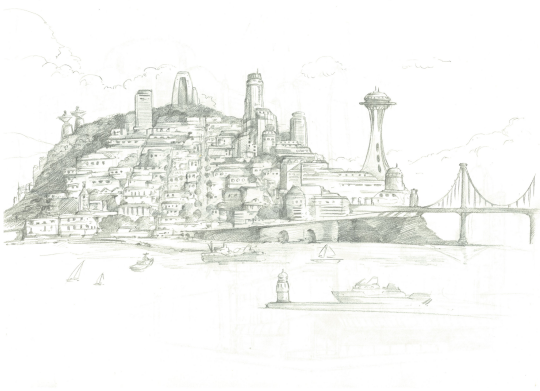
In order to make Sonic’s world look big, Sonic was initially considered a somewhat small hedgehog, but his size grew as development kept progressing until it ended up with the somewhat final version of it in Sonic 2. However, this approach of having a world where Sonic feels small in comparison to the things around him is something that would keep being a constant theme within the series. Whether it was through environmental design,enemy design or even game design gimmicks.

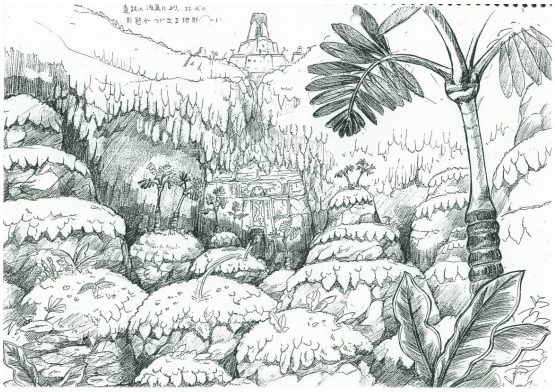




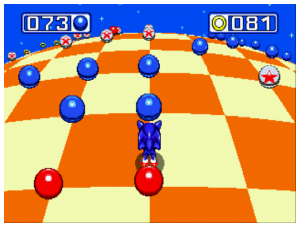


Similarly to Phantasy Star, Sonic The Hedgehog's world was also heavily influenced by the work of Akira Toriyama, with evidence towards it remaining from the inception of the series with the influence from Dragon Quest when it was still called "Twin Stars" to such a strong degree that its influence is still felt to this day, despite the series changing so much over the course of the years. Toriyama liked to make mundane looking things look interesting by giving them curves, more abstract shapes and overall changing the appearance so you feel like you're in a different dream-like world. For Sonic CD, Sonic Team even went as far as going to Studio Junio who was owned by Toei at the time and that did various works of animation for Toriyama's manga adaptations. Similarities are everywhere from conceptual material to final work.

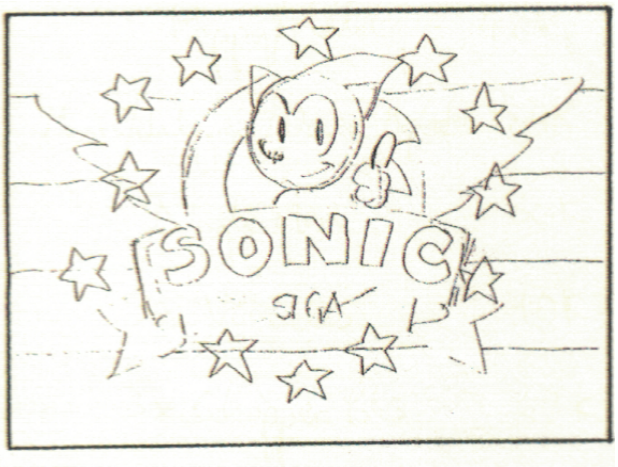




Sonic The Hedgehog is full of references to the work of Akira Toriyama. From the magical objects that make dreams come true, to the beta enemies used for testing in Sonic 1, to Super Sonic, to the blue spheres world being inspired by Planet Kai, to Tails and Sonic's dynamic being inspired by Gohan and Piccollo.



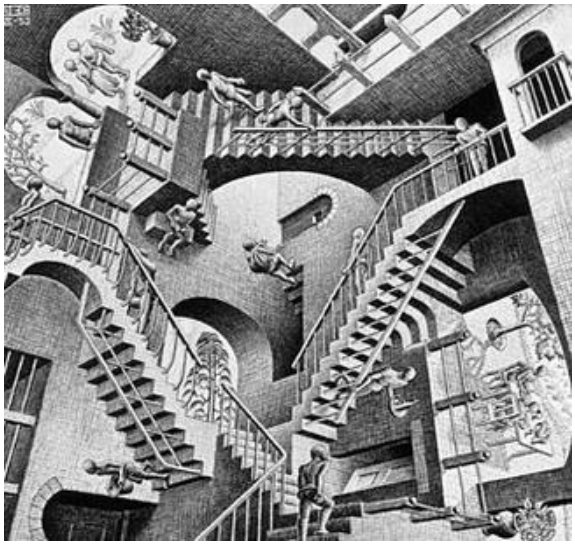
The main Title screen for Sonic 1 is a reference to the intro from the Dr Slump anime. Dr Slump was a mainstay reference when it came to designing Japanese mascots and Sonic was no different to this influence. The themes of freedom, nature vs technology, a childlike sense of adventure and a desire to fly all came first with Dr Slump.

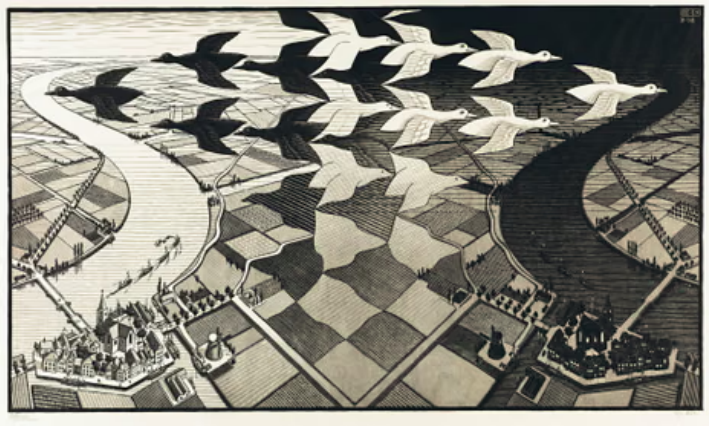


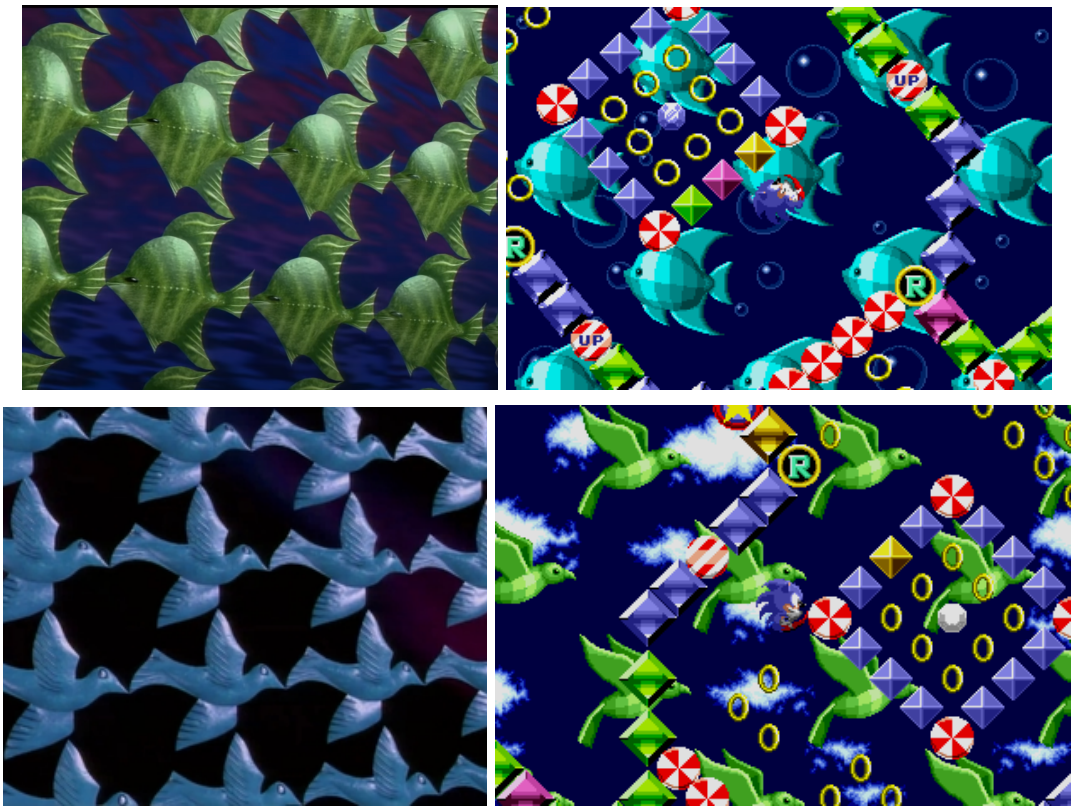
And so, by fusing all of this inspiration together, a star was born. The beloved fan favorite character that would help SEGA stand out more in the western market, while also starting Sonic Team's creative endeavours into more experimental game development in other genres. That is the story of how Sonic was created. It is not, however, the full story. The appeal behind why art is created is often layered with different levels of creative thinking, inspiration and knowledge.

2.2 - Into Silicon Dreams

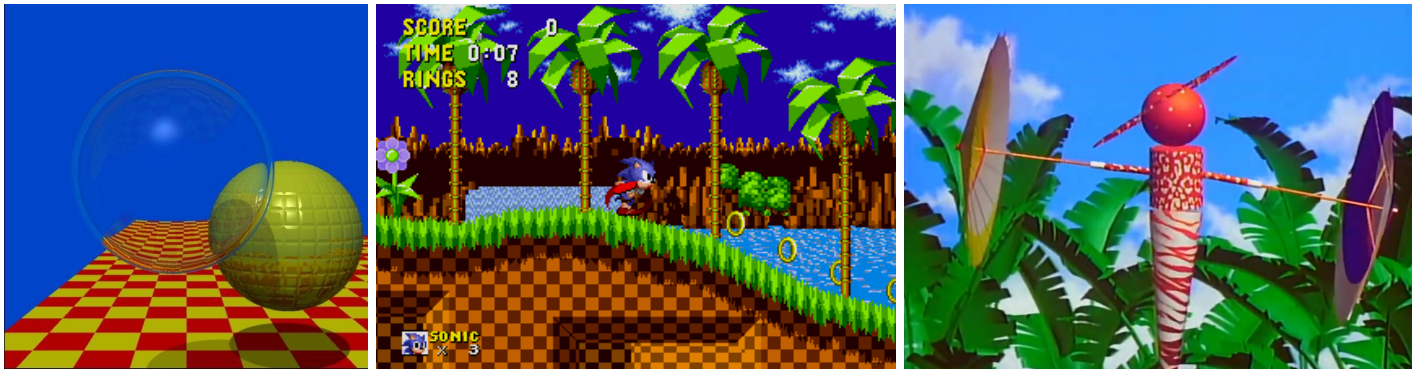
To say CGI inspired Sonic The Hedgehog is an understatement. CGI trends of the time alongside its gradual evolution were responsible for creating the iconic series visual identity. Sonic Team itself as a studio seemed to always chase for the most technologically advanced thing they could do within the inspirations for what they had. Possibly the most famous example of this is the short film "Infinite Escher" which was supposed to showcase high resolution rendering for its time. Even small things such as tech demos were inspiration material for the series roots. The short movie was based on various surreal artworks by the highly influential Dutch artist named "M.C Escher". Who created hallmarks of surrealistic artwork.





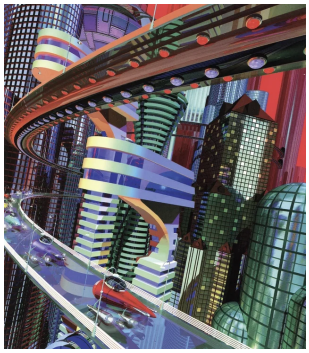
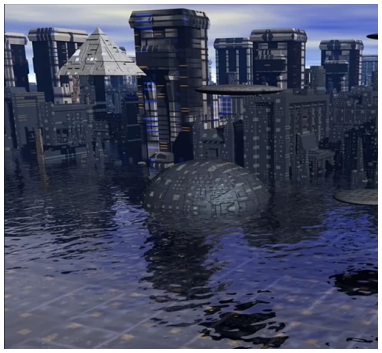


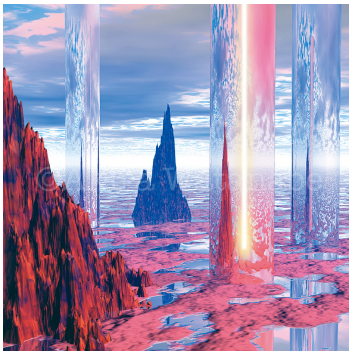
The iconic Green Hill Zone checkerboard pattern was very likely inspired by the highly popular CGI experiments such as Turner Whitted's revolutionary ray tracing showcase in 1979 and 1984's "High Fidelity" by Robert Abel and associates. Sonic was supposed to be cooler and more technologically advanced than the competition such as Super Mario as its own unique trait.



CGI technology of the era often used what is now called "Silicon Dreams Aesthetic", a term first associated with it by researcher Karl Kraft. Despite the leaps in CGI technology between the 80s and 90s, there was a consistent visual identity that was present in 3D animation. It was characterized by sparse landscapes or architecture, bizarre textures, simple visual effects and objects, environments, and 3D models that are surreal and "out of this world" in nature, like something that came out of a dream. These objects were often reflective, had simple shapes and were vibrant and colorful. CGI was

associated with fantastical and utopic retro futuristic structures. Sonic is part of CGI history.



As the franchise developed the CGI influences would only grow. With Sonic 2 using actual pre-rendered CGI graphics alongside Sonic 3 which additionally had its entire art direction made to look like pre-rendered sprites in both characters and environments.

"In terms of the graphics, our biggest theme for Sonic CD was "CG". When I joined Sega, it was my first chance to work with a Mac. "whoa...! amazing, so this is a computer?!"—yeah, I was pretty green, and I had stars in my eyes for anything "high tech"...

At the time, "CG" meant sparkling, sheen metallic surfaces that immediately jumped out at you and yelled, "THIS IS CG!", and frankly, I thought that aesthetic was the height of cool.

As Ohshima and I gathered up more and more CG reference materials, our excitement grew, manifesting in that title screen for Sonic CD—our first foray. To create that image of Sonic turning to face you, we used a polaroid camera to take pictures of a Sonic figurine, scanned them, and used that as our base to create the animation.

To provide contrast and highlight Sonic himself, we made the emblem behind him look metallic, to provide an overall impression of "CG". I think it was a success, in the way it clearly felt different from the previous Sonic games."

Kazuyuki Hoshino (2011)

[1]*Keyart for Sonic CD*

Lead Artist Naoto Ohshima. Rendering by Kazuyuki Hoshino.

[2]*CGI Commerical for Sonic CD*

Artist Unknown.

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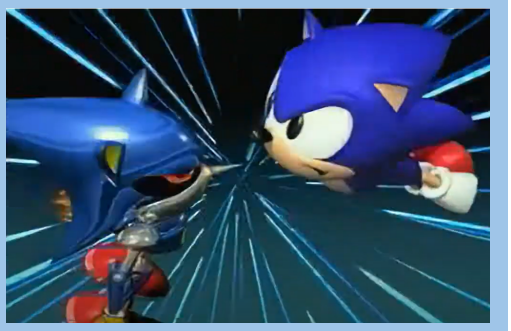
2



Examples of the influence of CGI in Sonic Team's work is clearly visible in their later works such as "Chaotix(32X)", "Nights into Dreams" and "Sonic R".

One of the main techniques Sonic Team used to achieve a more detailed look to its surrealism that was kept from the days of early CGI influence was photobashing.
The idea of "Photobashing" a picture is simple. It's basically a collage of photos of real life that are later digitally altered through photoshop to make them look like real places. This is often used to create believable fantastical worlds in fiction media.

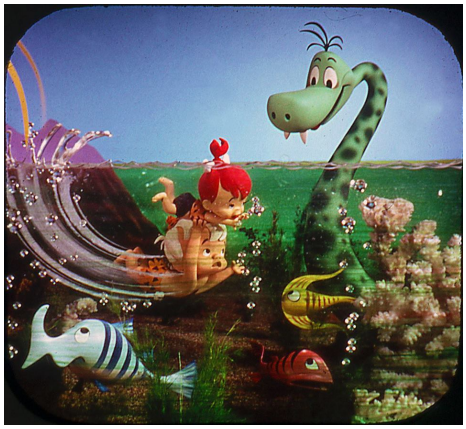
MtH

When applying this logic to videogames, often real life images are used as textures and as reference material for sculpting terrain to make it more true to life. This however does not diminish stylization of dream-like surrealism in CGI. The pictures are just more realistically detailed after using this technique.

PHOTOBASHING DOESN'T MEAN PHOTOREALISM

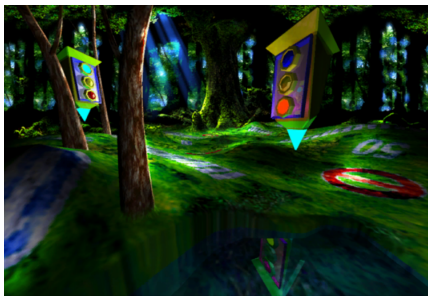
The misconception of Sonic Team wanting to achieve a more realistic look with their 3D games after Sonic Adventure is a very popular one, but one that is founded in misinterpretation. Sonic Team utilised photobashing mainly as a way to enhance the surreal dream-like environments, much like crafting a painting background in animation. Lots of Sonic's most pretty looking locations in 3D used the technique not as an artstyle, but as a way to enhance their already established artistic direction for the series with the 2D games and Sonic Adventure. High contrast, saturated, vibrant colors in surreal dream-like places with influence from anime, CGI and classic cartoons.

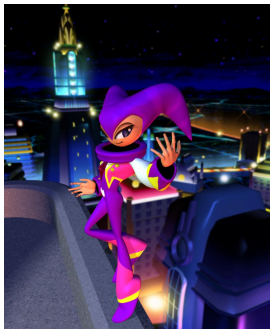
To achieve this look a very simple mindset is needed first and foremost direction wise. One must view the world around the exaggerated cartoon world around the character as somewhat of a diorama that utilises real world textures, clothes, objects, and elements to create a realistic scene through things that are closer to life despite being exaggerated with simplistic characters.
However the actual characters themselves remain stylistically exaggerated, as if they are expensive doll figures. A good example of this is the wide collection of dioramas made for the Viewmaster made to capture the art style of Disney cartoons (and others) into the real world through artificial use of light and painting-like backgrounds.

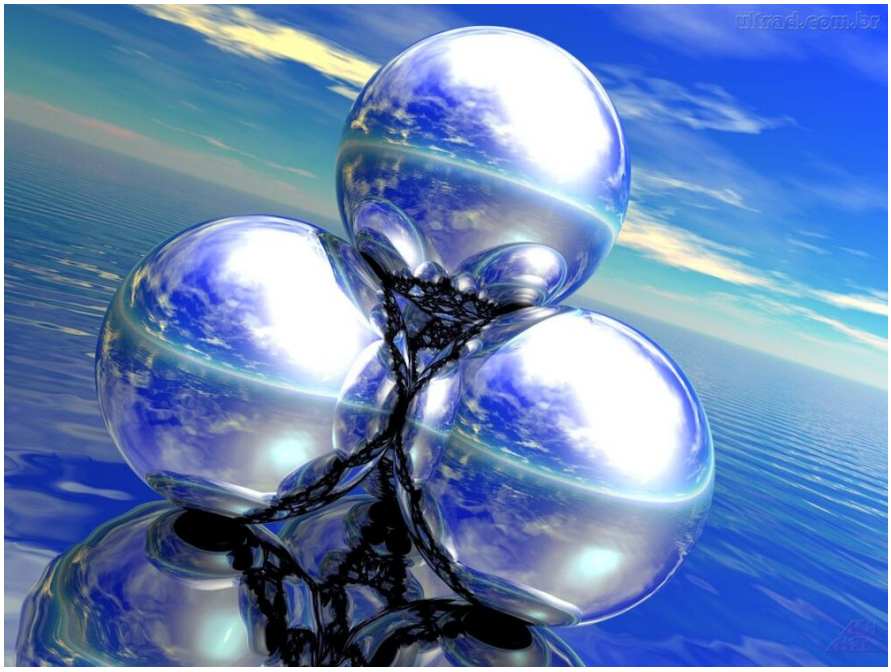


The worlds themselves might not be real, but the magic is.

It was during the 3D era when the studio found its footing aesthetically. The vibrancy, character design and world design was like no other. “Sonic Team” was not only an industry titan, but also one of the most unique gaming studios when it came to pushing the boundaries of conventional ideas of what a game even is across multiple games like “Burning Rangers”, “Phantasy Star Online”, “Sonic Adventure”, “Sonic Jam”, “Sonic 3D Blast: Flickies Island”, “Nights into Dreams. Sonic Team is its own inspirations and without them, Sonic Team isn’t as unique.







While most previous examples have mostly been from games from the 90s and early 2000s it is important to note that Silicon Dreams as an aesthetic itself changed throughout its lifetime. Around the late Saturn, early Dreamcast era, a new aesthetic known as Y2K Futurism (or just simply Y2K) was the successor of the Silicon Dreams style using surreal imagery of CGI with memphis on reflections and dreamy imagery, with a focus on the future of technology with new design elements that emphasized the evolution of CGI rendering through reflection and sleek metallic retrofuturistic imagery. Y2K itself as an aesthetic is highly defined by usages of chrome, water and the color blue, which fit very well with Sonic The Hedgehog and was widely adopted in the 2000's.
The Y2K aesthetic would first be introduced by artist Satoshi Okano who would later be greatly influential in the creation of the look for Sonic Adventure with its large thick rubbery 2D linework another key part of the Y2K look. A look that became synonymous with the Adventure games and Sonic as a whole.

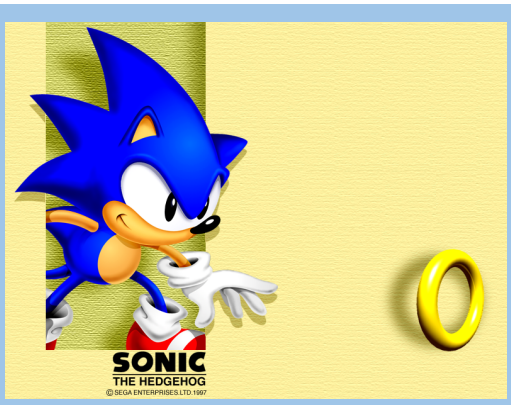
These influences then further can be seen in games such as Sonic Heroes and the Sonic Riders series with Riders specifically basing itself in a Y2K look more than any other game series, likely due to its futuristic focused theming.

2.3 - Airbrush Fusion

As previously mentioned a key important aspect of Sonic's visual identity is airbrush artwork of the 80s and 90s. Whilst typically the CGI inspired and Retrofuturism look of airbrush would overlap with shiny chrome, wireframes and advanced Sci-fi tech being staples of both. You would rarely if ever see this look overlap with the cartoon style made famous by Susumu Matsushita who had popularized this look in his covers for Japanese fashion magazine "*Popeye*", themed after the classic western comic and cartoon character and longrunning gaming magazine *Famitsu*. Sonic however of course being a franchise inspired by all three types of art to begin with incorporated all three's style of airbrush into its iconic look.

Artists Akira Watanabe, Yuji Uekawa, Yasushi Yamaguchi, Osamu Muto, Kazuyuki Hoshino and more would all mix together these fundamentals to create Sonic's signature airbrush look.

Sonic Drift art
(Rendered by Akira Watanabe)



Sonic Jam art
(By Yuji Uekawa)

Sonic The Screensaver art
(By Yasushi Yamaguchi)

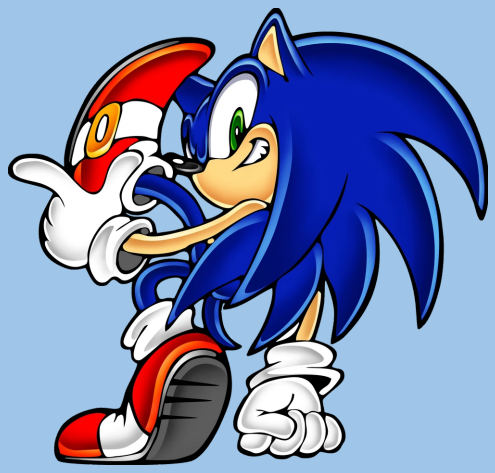
Whilst every artist might have the different aspects come out in their own style it is imperative to know how deep these influences run to the visual identity of the franchise. From Sonic's signature raised brows and wide dimpled smile of the earliest art:

Sonic 1 Key art
(Line art by Naoto Ohshima
Rendering by Akira Wantanabe)

Misc Sonic Art
(by Osamu Muto)

Necky the Fox (Faitsu Mascot)
(By Susumu Matsushita)

the loose posing and large rubbery shoes of Yuji Uekawa’s Classic and Modern Art:



Sonic Jam & Sonic Adventure
by Yuji Uekawa

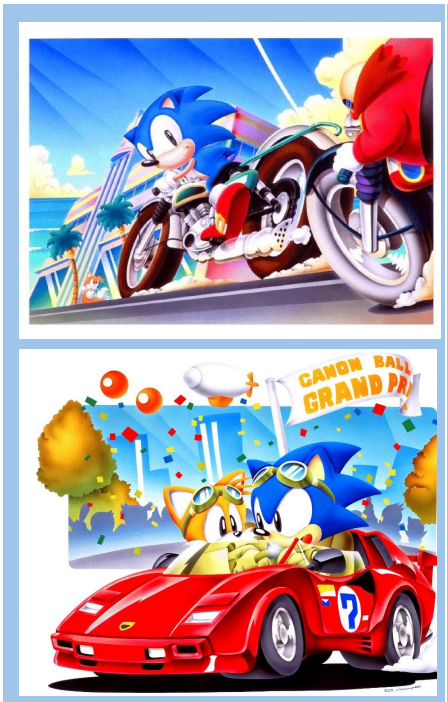
Art by Susumu Matsushita

To the more sleek, mechanical, and CGI inspired art of Yamaguchi and Kazuyuki Hoshino:

Sonic Drift art By Yasushi Yamaguchi

Sonic CD art by Kazuyuki Hoshino

And of course the iconic full scene art by Osamu Muto & others famously compiled as a collection in *Sonic The Screensaver*, incorporating all aspects of the fusion:



Sonic the Screensaver art
(by Osamu Muto, Naoto Ohshima and more)

Hiroshi Nagai art (Top) and Susumu Matsushita art (Bottom)

Uekawa has even sited the work of Susumu Matsushita as an influence on his work:

"Uekawa would be a major influence in Sonic's new look. Citing … Susumu Matsushita's airbrush art … "

Cook and Becker Interview with multiple Sonic Team Staff, Link.

Sonic Adventure Promotional Art

Yuji Uekawa.

The type of Californian based “City Pop” art made famous by Hiroshi Nagai can even be seen beyond Sonic’s own airbrush work to being a key influence on the tropical resort & city theme seen throughout the entire Sonic franchise and even reaching into other Sonic Team franchises such as *NiGHTS Into Dreams*.

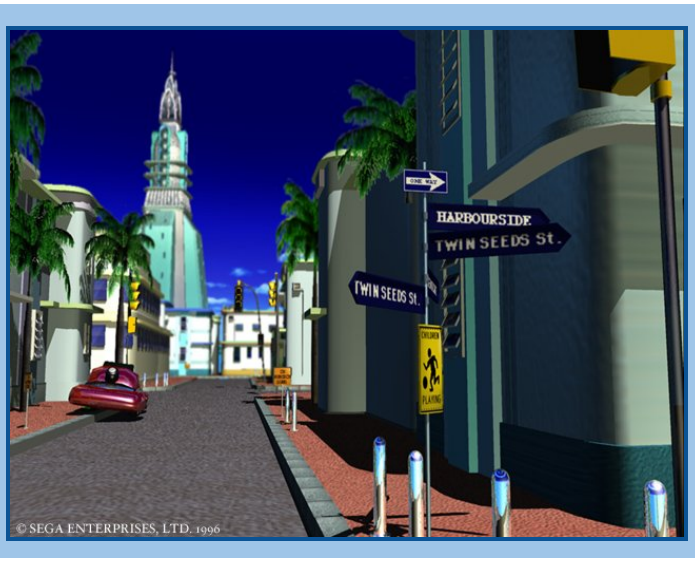
“It was California that made reference to them.”

[in reply to NiGHTS environment renders]

Naoto Ohshima, Twitter.

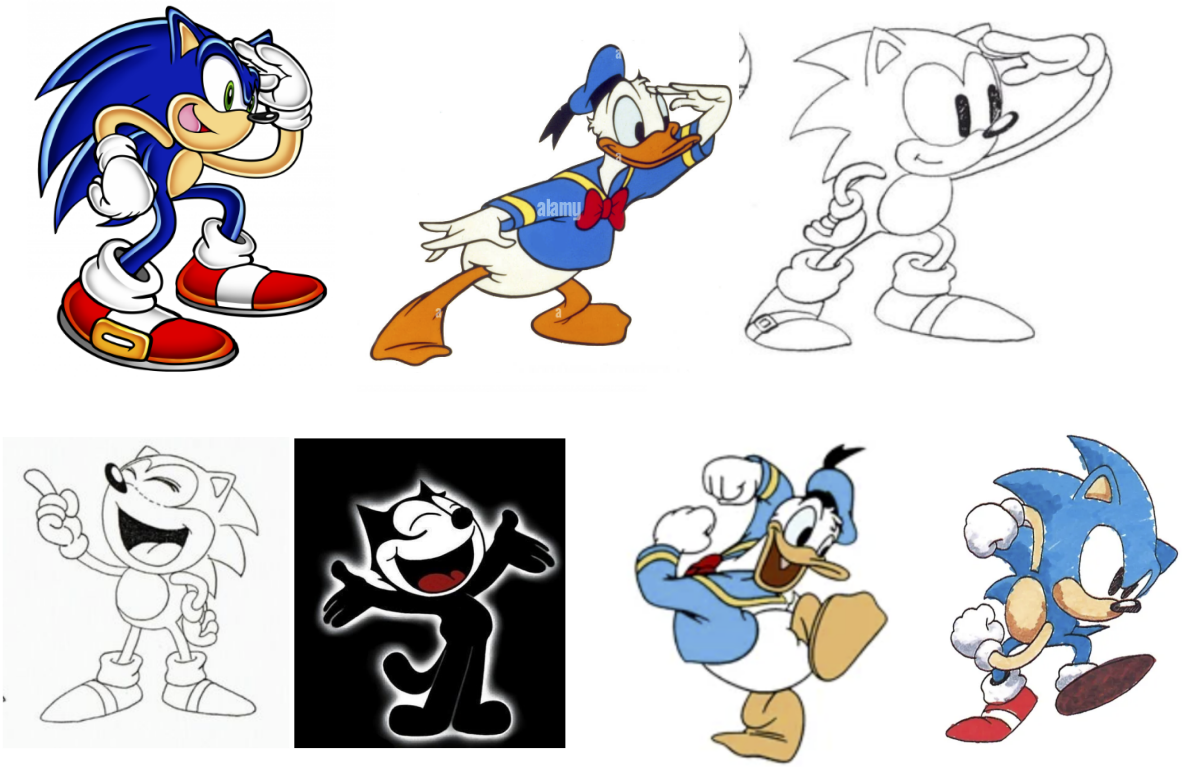
Render of Twin Seeds from NiGHTS Into Dreams.

Unknown Artist.



There is an endless number of airbrush artists from the 80s and 90s that have influenced the look of the series from all over the globe of all different styles but the examples provided should give a small insight into the importance of all sorts of airbrush work from the 80s and 90s and the artists that defined them.

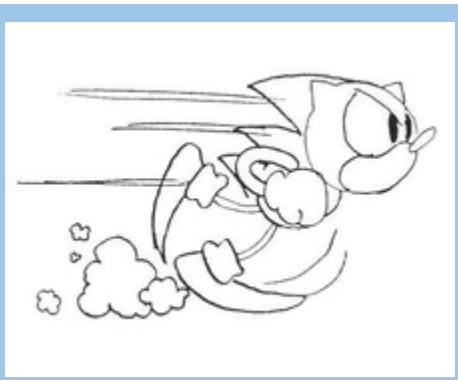
2.4 - Cartooning, Gesturing and Character Acting,



Sonic comes from a much simpler era in cartoons, and this type of motion associated often with “Mickey Mouse”, “Donald Duck”, “Felix The Cat”,“Looney Tunes”, “Tom and Jerry” is integral to Sonic’s identity.

This era is known as “The Golden Age of Animation”. While it is commonly said that Sonic’s western influence is ***purely*** “Rubberhose” cartoons from the 20s and Early 30s. This however, is only a small part of the whole of The Golden Age of Animation which lasted from around the early 30s all the way to the late 50s. Most of Sonic’s most important western influences come from the 40s and 50s and not as much the earlier material as is thought.

The exact source theorized for a lot of Sonic's defining character animation seen in the first game is a Japanese Laser Disc compilation of Golden Age shorts from 1986, ディズニーのこわ～いお話. A compilation of scary-story themed shorts by Disney. The most notable inspiration from this disc is it majorly influenced the look of Sonic's iconic pinwheel running animation from two of the shorts such as the earlier mentioned *"Mickey's Parrot"* as well as *"Lonesome Ghosts"*:

		
Mickey's Parrot (1938)	Lonesome Ghosts (1937) (Flipped)	Sonic The Hedgehog Concept art (~1990-1991) (Flipped)

However there are many more examples both from the 1986 Laser disc which can be seen in the full collage here:
ディズニーのこわ～いお話 Examples

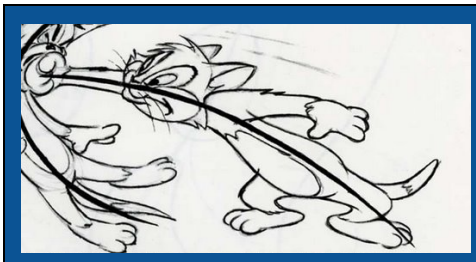
As well as general Golden Age animation of the era:
General Golden Era Animation Examples

The examples above show official Sonic art and their similarities to the type of character acting seen in said classic cartoons. However, the point of the examples are NOT to say Sonic should only ever be like a rubberhose cartoon and or never evolve from Sonic 1 where the influence was at its most evident. To say that would not only be ***limiting*** but ***wrong***. Homages have their time and place but Sonic acts uniquely to his personality and style, which is of course inspired by the classic western animation, but not merely a replication of it. Even as the series evolved into the dreamcast era it simply expressed these influences in different ways. What is important is to show Sonic using good principles of gesturing & character acting, which is important no matter how you want to represent the series as they are the foundation for posing a character.

Warner Bros. and Disney animator Scott T. Petersen has great overview video that goes into further explanation and advice on gesture drawings that is highly recommended for more info:

Gesture Drawing Advice from Disney animator, Scott T. Petersen

Continuing on, Sonic should always be expressive, even when drawn still. His body expressions and facial expressions show swing, balance, movement and motion. This is one of the principles of classic animation, and should always be followed for Sonic. One good way of making sure the character has this bounce is through lines of action. You should plan your figure and its details to accentuate this line. By doing so, you strengthen the dramatic effect of the action. The first thing to draw when constructing a character is the line of action, to then fill in the rest of the details of the character.

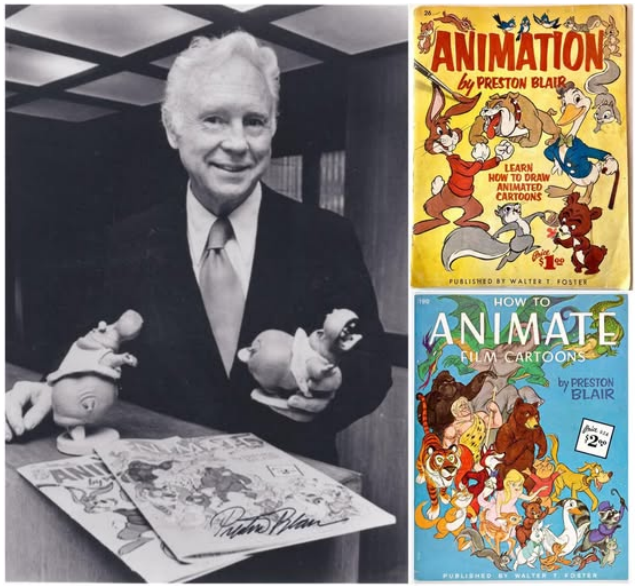
	The line of action is merely a way to showcase weight and force of impact in animation. Angles and elements should synchronize with each other by contrasting each shape. It's an exaggerated motion for visual clarity.
	To tease the idea of curling into a hedgehog ball, Sonic is constantly depicted with all of the weight going into his head leaning forward, while the rest of his body is struggling to keep up with its power. It’s part of what creates the bouncy look of early Sonic artworks.

Sonic’s roundness can be used to emphasize agility and motion in the character. Dynamic posing SONIC gets a lot easier when the laws of human character posing aren’t applied.

SONIC THE HEDGEHOG posing should always consider how the character is made for animation. Posing shouldn't be stiff as that visually doesn't make the idea of motion clear. Sonic is an animated character after all and follows rules of animation.

"The animated character should be as expressive for animation as an actor's job in live action . Both should be masters of portraying emotions." - Preston Blair: Advanced Animation

This quote is by Preston Blair a legendary animator working on many classic films and shorts at M.G.M. and Disney with works such as Mickey and Donald shorts, Pinocchio, Bambi and more. The first edition of his book "Advanced Animation" can be found at the link provided below as an educational resource from Animation Resources. It is a fantastic and informative read and will be seen quoted again throughout the rest of the document.
https://animationresources.org/instruction-preston-blairs-advanced-animation/



The point of character acting is to have the character's attitude portrayed in a way that resembles their personality, feelings and emotions through the expressive appeal of animation. Otherwise, no cartoon character would be unique in terms of acting.

"I think that is traditional american cartoon style.Oshima-san & Miyake-san[1] & me, loves this style😊"

[1]Takumi Miyake is a key artist for the environments of Sonic CD & NiGHTS, and the Chief Artist of Ristar as well as Chaotix where he created Espio The Chameleon.

Satoshi Okano, Twitter.

Pencil Sketch made for Sonic Adventure. Later finalized by Yuji Uekawa

Satoshi Okano.

The last thing to note is that while Sonic is inspired by Cartoons, it is important to note that they are specifically those from the *Golden Age of Animation* from the 30s to the 60s. Animations from this time (especially the feature films) whilst exaggerated and sometimes comical was done with tact and purpose and were still thought of as typical pieces of film and treated just as seriously as any other movie in cinemas at the time, with key audience members being adults going for their own entertainment, instead of for children.

This is brought up because sometimes it is confused that the Sonic franchise is inspired by *all aspects of cartoons*. Especially those of the 80s and 90s with notable examples being *Tiny Toons Adventures*, and *Animaniacs*. This however is not true. These sorts of cartoons' identity is within their zany movement, random slapstick and loud, and often cynical meta jokes.

These sorts of shows in the 80s and 90s are their own completely different type of cartoon created by the advent of television being the main place for a lot of cartoons and had simply become a medium only associated as "being for children".

It is important to remember that Sonic takes from the more cinematic, sincere roots of animation from the golden age when looking at cartoons and not get sidetracked because obviously whilst having comical elements is not a "wacky zany cartoon".

In conclusion the influence of the golden age of animation on Sonic is undeniably important due to being such a key influence to the franchise. Even before Sonic was created many of its key staff had their start at SEGA creating games for Disney based on the golden age of animation stories and characters. With notable examples being key artist for Sonic 3 & Knuckles; Takashi Yuda (and co-creator of Knuckles) whose first art credits were on *Castle of Illusion starring Mickey Mouse* (1990), *QuackShot starring Donald Duck* (1991), and *World of Illusion Starring Mickey Mouse and Donald Duck* (1992), with Yuda being the art director on the latter two. His time working as the art director for these two games had a clear influence on his spriting style going forward and many comparisons and influences have been drawn from it and the spriting style of Sonic 3. Most notably the large expressive hand gestures similar to the ones seen in Preston Blair's guide. Another key artist that had worked on *Castle of Illusion* was Rieko Kodama who was a key member of *Sonic Team*, having first worked on many of the *Phantasy Star* titles before working on the

original *Sonic The Hedgehog* having done the backgrounds for Labyrinth Zone, and Starlight Zone as well as returning to do zone art in *Sonic The Hedgehog 2*.

From the personal study of the work to capture its appeal in Sonic to team artists having familiarity working with golden age character design this influence is what helped make Sonic such a timeless character to this day.

2.5 - Selective Sacrifice

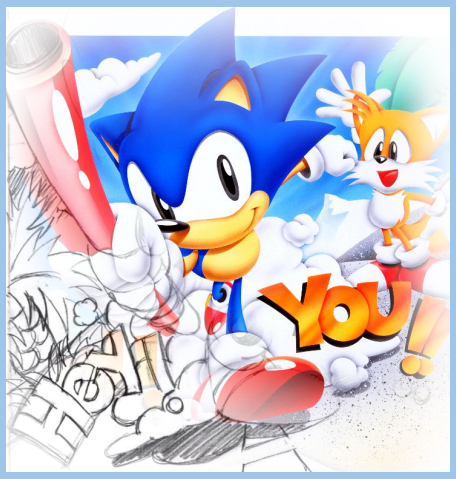
“私はクラッシックソニックのキャラクター全てデザインしていません。私は中さんと相談して色々なデザイナーに作らせよう。私の世界だけで作るより、違うデザイナーが作ることで世界が広がると思ったからです。テイルス、ナックルズ、エスピオ、マイティ、ファング等素敵なキャラクターが生まれました。”

“I didn’t design every single one of the characters for Classic Sonic. I consulted with Mr. Naka, and let various designers create them. I thought that having different designers create the characters would expand the world, rather than having them created only in my world. Tails, Knuckles, Espio, Mighty, Fang and other wonderful characters were created this way.”

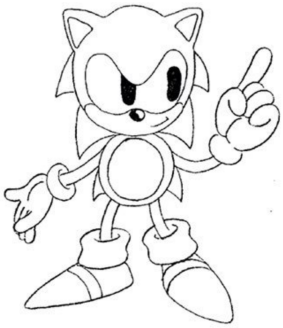
Naoto Ohshima, Twitter.

Artwork of Sonic passing a baton.

Line work by Naoto Ohshima. Rendering by Osamu Muto

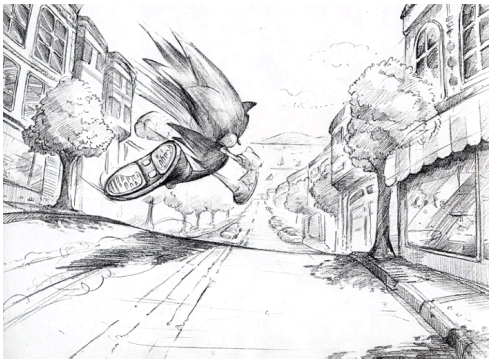


If character design is such a focused, purposeful task, it may seem like it's completely unjustifiable to ever change it. It may also seem like it would be unacceptable to let different artists with different perspectives design new characters to expand existing stories and works of art. Although, that isn't true.



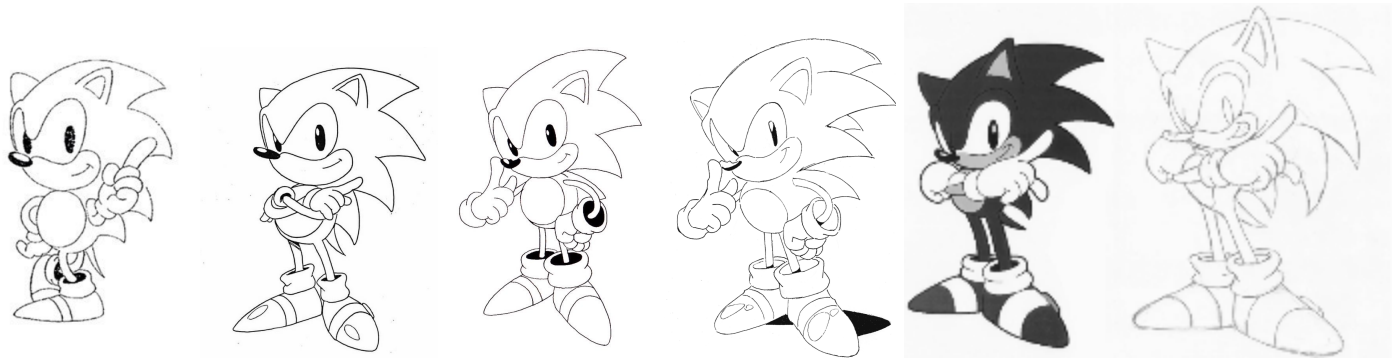
SONIC ADVENTURE (1998) for the SEGA DREAMCAST introduced new designs for existing characters of SONIC that have a radically different mood to them, yet we’ve commonly

accepted them and they're considered amazing by a lot of people. What makes changes such as this good?



Selective sacrifice is a process of continuous change from a simpler standardized state to a more complex, or better state for newer creative purposes.

Much like life, art can "sacrifice" or exchange the material of its inspiration, if the same themes and goals of the old material that originally birthed its design philosophy remain. The introduction of new material has the ability to further expand themes, or accomplish certain goals more effectively.

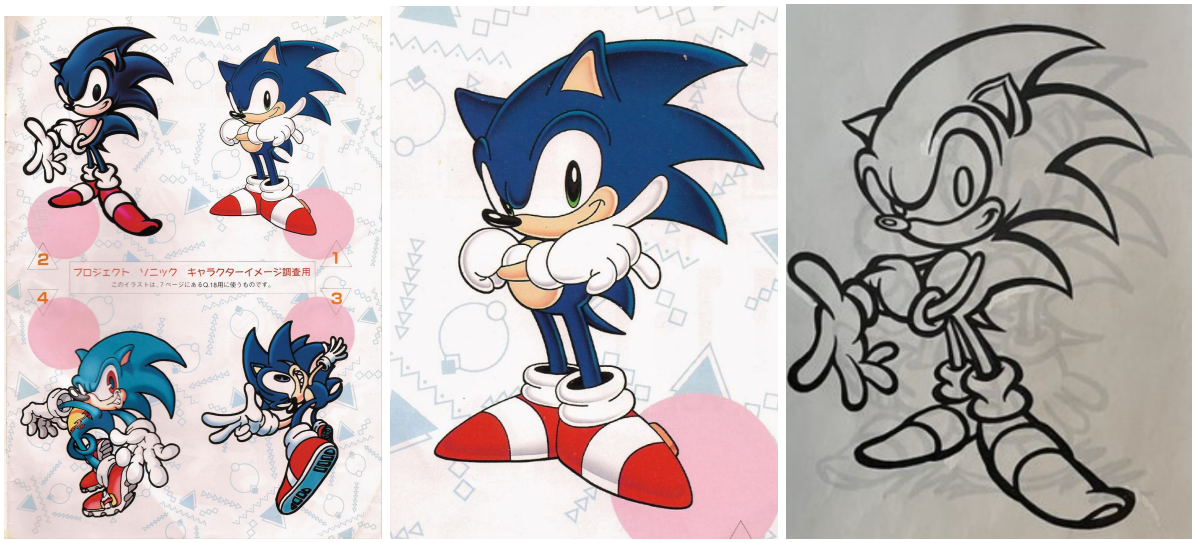


SEGA had decided that changing the designs of the SONIC characters was a necessity for Sonic Adventure to succeed commercially: People wanted louder, prouder, more aggressive characters, in worlds that had realistically painted objects. The employees of SONIC TEAM

held a contest amongst themselves to draw Sonic in ways that would appeal to the market of 1998. Since the market of the 2000s wanted to use CGI to display realistically painted objects, the surreal toy-like appearance of CGI from the 1980s and their inability to flex shapes defined by math had to go. However, their legacy in SONIC would always remain, because the themes that they produced would remain, despite differences.
The new SONIC had to be new and exciting, without confusing the customer or dramatically changing the stable and reliable ideas that the artists wanted to work with.

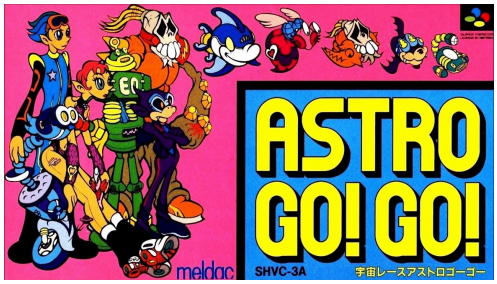
In other words, the design philosophy had to experience a change that would be small, with big consequences.

All of SONIC ADVENTURE concept art for the eventual redesign borrows "aggressive" appearances from street graffiti or magazine illustrations, things of youthful urban pop culture, something that SONIC is already based on.



Ultimately, the winner of this contest was Yuji Uekawa's pitch (center image), where he depicted SONIC somewhat the similar to how it was as before, using thick outlines, bright secondary outlines, and gradients to maximize the distinction between colors and shapes featuring more edges and sharp angles, based on the appearance of paint from a precise

spray-can. Bright, attractive colors and simple shapes were already a part of SONIC's artistic toolkit, and Uekawa merely recontextualized them.
SEGA, however, did not appreciate the minimalism of this change, and so, Yuji Uekawa was assigned to transform his pitch even further. He was assisted by Satoshi Okano, to decide how to transform SONIC using aspects of all the designs in the "contest" using Uekawa's design as the base, notably incorporating the smirk from Miyake's proposal into what would eventually become Adventure era's Sonic iconic signature smirk.



Uekawa and Okano were able to turn that loss into a trade-off by reconsidering the old American cartoons that inspired SONIC in the beginning: These cartoons used many simple shapes to construct their characters, but would stretch and reshape them heavily depending on the context to express things in a way that 1980s and 1990s CGI could not, and the pair of artists seized the potential of that idea. SONIC was always a character of thrilling action and speed, and this tool could be used to emphasize that further. A few key appeal characteristics were lost but this created new challenges, such as the question of "what is the appeal of Sonic?". While we don't have the entire answer, we hope to help whoever wants to understand the thought process and some of what we believe to be answers to this lingering question.

Until the end of this document, by learning more thoroughly about design decisions, each creator will be able to do Sonic illustrations with the same reference material as Sonic Team. A lot of knowledge about Sonic from discussions has not been properly turned into research material. We encourage readers to think about creative decisions, approaches and how this affects their vision of the Sonic series, in order to achieve greater creative goals. Sacrifice is necessary for change, but it shouldn't happen without proper knowledge and supervision to maintain unique characteristics and appeal. This is the goal of this document.

2.6 - Dreams of Luxury

A lot of what people commonly describe as the “Sonic The Hedgehog” aesthetic contains words such as “Surreal, dream-like, features simple abstract shapes” but they often forget an important aspect of this, which is how exactly the Sonic The Hedgehog series applies this in its own unique way.
What was described earlier as the lead thought process remains truthful for the conceptualization of Sonic as an idea, but just knowing that doesn’t bring us closer to the full picture, but rather to each individual’s interpretation of these basic ideas, which can often lead to confusion. This section is dedicated to clear up any eventual misguided attempts at applying these concepts.

Sonic is Photography

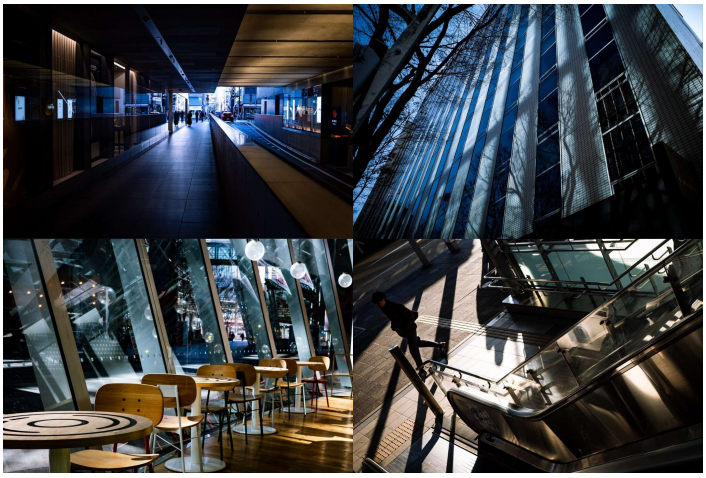
A lot of environments in Sonic have direct inspiration from real life places like Japan, New Zealand, California, South America and many more. Photography in itself is an art form of trying to capture the beauty of a scenery at its fullest through usage of contrast between different tones and heavy light source usage. Sonic’s environments directly reference this idealistic style of photography that's also very popular in Japan. In photography it is very common to purposefully exaggerate color contrast, edit pictures so the place looks more dreamy. Sonic pulls a lot of influence from this type of stylization of reality. (Picture by Lot (@gusttfronty797 on Twitter)

(Picture from https://www.southamerica.travel/paraguay/tours/asuncion-iguazu-falls-paraguay-tour)

(Picture by 空気 (@ikitakiroku_ on Twitter)

(Picture by おくで (@photo_okina on Twitter)

(Picture by fabrik_view (@hom_fab on Twitter)



(Picture by テツさん。(@tetsu_link1 on Twitter)

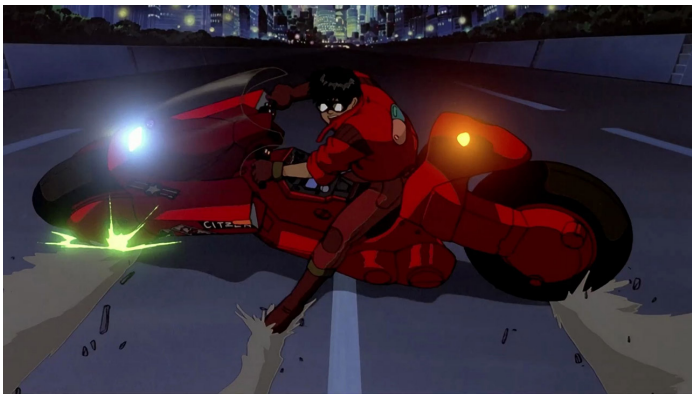
Sonic is Anime

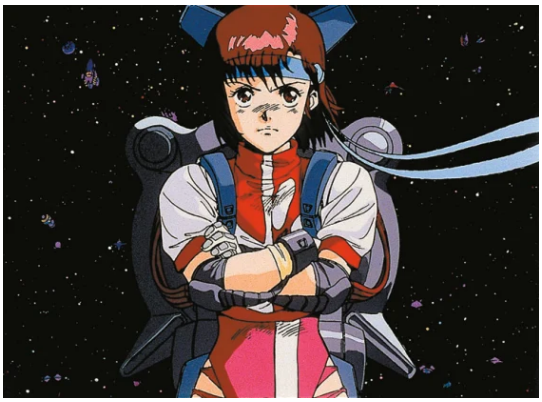
People often forget that Sonic is in fact Japanese animation, and shares the characteristics of such. To simplify, we will categorize the unique characteristics of this type of animation that Sonic The Hedgehog shares.

- Anime is often more grounded and realistic, taking place on our earth while still being a stylish abstraction of real life. Oftentimes people mistake Sonic's world for something a lot more distinctly surreal, to a point where people forget that it takes place on our planet Earth, like a lot of japanese animation. The main factor that makes Sonic's world distinct isn't a lack of resemblance to real life, but rather a stylized way of presenting real life through colorful and exaggerated idealistic hand drawn ways for narrative purposes.

- Since animation can work with any idealistic scenario an artist can draw, these depictions often have high contrast and saturated colors that resemble edited pictures of beautiful places in real life, from back when professional photography was a variation of hand drawn idealistic drawings.

- Sonic The Hedgehog was made during a time where cel shaded animation was at an all time popularity in Japan, characterized often by its very heavy usage of contrast and saturation, coloring and neon-esque aesthetic that was largely popularized during the 80's through pop art.





Sonic is Deco-Luxe

A melange of Art Deco & Streamline Moderne revivals that emerged mainly in the mid 1970s; and peaked in the 1980s and early 1990s. This style differs from the earlier Art Deco revival in the 1970s, Disco Deco, as it's more focused on the luxury side of Art Deco & the Roaring '20s (tying into the general cultural milieu of the go-go 80s).

Consumer Aesthetics Research Institute https://cari.institute/aesthetics/deco-luxe

- A lot of the context behind the artistic movement of Deco-Luxe and its popularity during the creation of Sonic The Hedgehog has been lost. Deco-Luxe is a variation of the coined term for “Artistic Decoration or Art-Deco”. While traditional “Art-Deco” often had a lot more influence from the traditionalist cultural activities from each area to try and bring some manmade artistic beauty into our living spaces, the “Deco-Luxe” aesthetic is merely bringing this same idea of artistic decoration into a more universally comprehensible aesthetic of luxury.

This artistic architecture movement has a clear number of aesthetic characteristics that Sonic The Hedgehog shares characteristics with, such as: Neon lights usage, Saturated color contrast, usage of shiny, reflective and transparent decorations, repeated simplified patterns like checkerboard, references to ancient civilization architecture, usage of contrasting simpler color shades and often usage of materials like gold, wood, marble and glass to evoque a mystical dream-like surreal look in environments. The aesthetic is largely inspired by the growing popularity of disco, airbrush and more colorful lighting that defined the 80's.

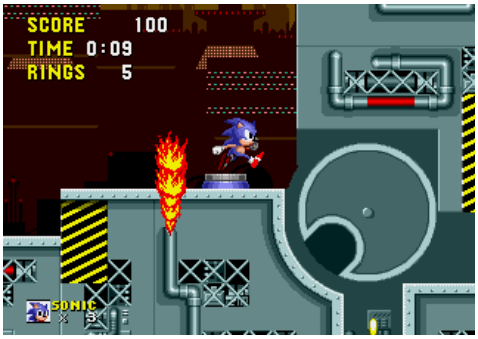
Sonic is Dream-like

Ever since around the beginning of the Sonic The Hedgehog series, the idea of the heroes living in a dreamland utopia and the villains in a nightmareland dystopia made itself into a staple of the series. In order to challenge the very ideas of good and bad dreams visually, concepts from a debate in the 80's on how to evolve environmental decoration itself "deco art" became the main source of inspiration for how the Sonic series would fuse all of these aesthetics together for a cohesive narrative purpose. The works of "Carl Jung" were incredibly important for the philosophy of this aesthetic, especially as it evolved throughout the history of the series.

Every single place in the Sonic series is either a Dream, or a Nightmare.

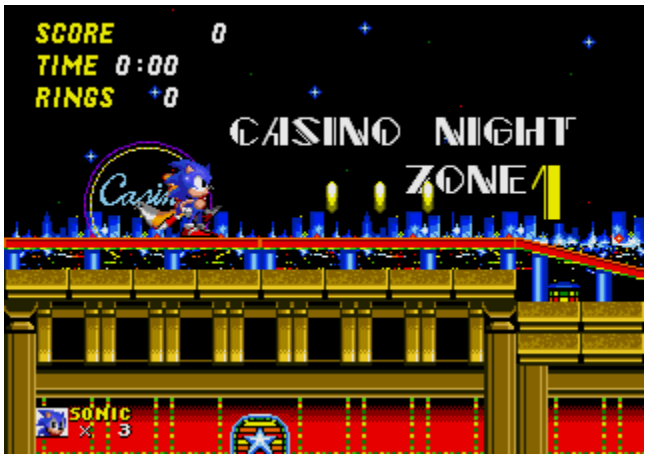
Green Hill Zone - Dream utopia where Nature is as pretty as fancy manmade decoration.

Spring Yard Zone - Hazard filled fusion of natural and industrial luxury that poses itself as a threat and a middle ground of chaos and peace by eggman, inspired by the look of casinos.



Scrap Brain Zone - Dystopian Industrial Nightmare.

Marble Garden Zone - Dream utopia where ancient civilizations worked together alongside nature and its shortcomings like the Lava being used as an elevator. This zone uses more traditional Artistic Decoration that later inspired the refined Deluxe Artistic Decoration look.



Casino Night Zone - Dream utopia of a futuristic society that lives alongside technology and has fancy nice places like casinos, that are completely industrialized but not entirely bad, showcasing the nuance that technology and nature aren't opposing forces but rather things that can work together and be used for fun and entertainment without harming others. However, the real beauty of that place lies within the people and the aesthetic, not the exploitative gambling machines Eggman built, showcasing Eggman's hypocritical ideal world.

Radical Highway - Nightmare Dystopian city location where everyone wants you dead despite not even knowing you from the perspective of Shadow.

City Escape - Utopia reality where being chased by everyone can also be a moment of fun and just finding out the unique things about the place you are in, since risky adventures are fun from the perspective of Sonic.

There are countless more examples in the other Sonic games like Chaotix 32X, Sonic CD, Sonic The Hedgehog 3 & Knuckles, Sonic 3D Blast, Sonic Adventure 1. All of these places depend on the character’s vision to correlate to how they view it, whether it's a surrealistic dream or a surrealistic nightmare. Living through both of them is part of learning who you are and why certain ideals exist, which is part of the narrative of the Sonic The Hedgehog series. Abstraction has meaning on its own, to find a real answer to find peace.

2.7 - The Appeal of Sonic Characters

Cartooning in any media is the act of exaggerating a particular character's personality through drawing. The Sonic series is very specific in how it does its cartooning, mostly because it reiterates the idea of folktale characters (with the largest inspiration of those being Santa Claus who as mentioned was a major influence on the design of Sonic's iconic boots). The Sonic cast often doesn't resemble the exact animal they're called, but rather are more focused on portraying the personality of the folktale characters creature through visuals by fusing many different animal types to achieve a particular look. Of course, there are exceptions but for most characters this is the case.

The most important aspect of good character design in the Sonic series are silhouettes, shape language and the eyes.

- Strong silhouettes help differentiate and make a particular character feel more distinct, unique and communicate to the audience exactly what to expect from the character just from a quick glance.

「ソニックはハリネズミの様な妖精なので、実写になってもハリネズミに寄せる必要はないのです。 ミッキーは実写になってもネズミにならないでしょう。 彼らはみんなが信じてくれると生き続ける事ができる妖精なのだから。」

"Since Sonic is like a fairy [from a fairy tale] hedgehog, there's no need to make him look like a [realistic] hedgehog even in a live-action adaptation. Mickey wouldn't turn into a [realistic] mouse even in a live-action film. After all, they are fairies [from fairy tales] who can continue to exist as long as people believe in them."

Naoto Ohshima on Twitter/X

Translator's Note: Ohshima isn't literally referring to the fairy tale genre or fairies themselves but rather more so the fictional magical creatures in it that are often depicted in fairy tales. Neither Mickey nor Sonic are literally fairies that are only present in fairy tales after all.

PART 3 - Criticism

This section will highlight specific mistakes that have been frequently made by both amateur fan-artists and professional licensed media alike in the pursuit of portraying the fullest appeal of SONIC THE HEDGEHOG.

We will be mainly focusing on mistakes made by official media for two reasons:

1. We are not interested in publicly shaming individual fan-artists.
2. Most mistakes made by fan-artists originate from replicating the mistakes of official materials, because the artist assumes the official product is without error and is thus the most reliable thing to resemble.

Regardless of which iteration (1991, 1999, 2003, 2006, 2008, etc.) of the characters you're depicting, these guidelines are good to keep in mind.

We'll be writing these with the assumption that you read Part 1.

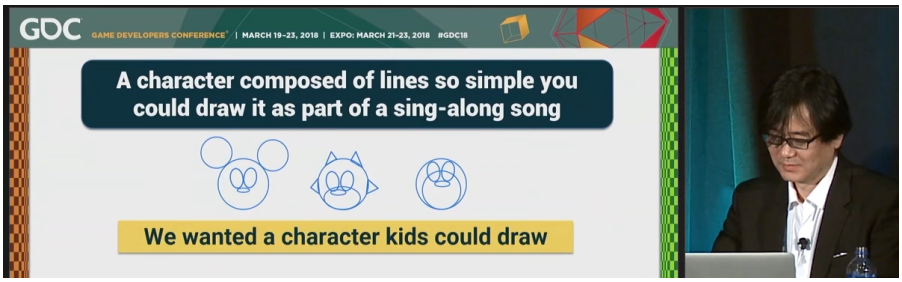
PS: The Sonic series might have used a lot of what we refer to as a reference point initially as evidence suggests, but this does not mean that it is the current direction of the franchise. The intention of this rule establishment is to bring the series strengths in terms of expressiveness back, and closer to original creator intention despite changes. It is a fair minded critique with nothing in mind except love for the series at its best and is in no way meant to be an attack at anyone at all. We do not condone using this document as evidence or reasoning to attack and or slander any artist.

3.1 - Redundant Mistakes

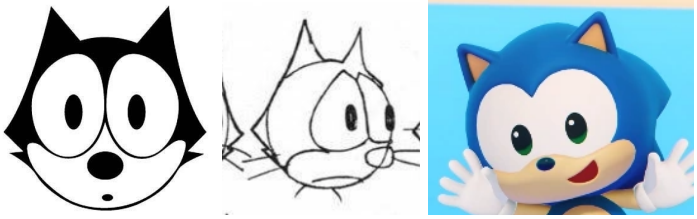
Before we move on to character specific characteristics, we'll briefly talk about a few mistakes that often happen by accident or due to simple misunderstandings. Many of these explanations will be using SONIC as a demonstration, just because it is easier to dictate things that way, given his simplistic nature and how many characters in the series use him as a base.

Mistakes of the Eyes

This may seem silly to discuss, and it is unlikely that all artists intentionally make this comparison, but near-all misunderstandings of SONIC's eyes can be explained using this. Sonic Team wanted a character that kids could draw. A character composed of lines so simple you could draw it as a part of a sing-along song. One that is much like Mickey, Felix or Doraemon.

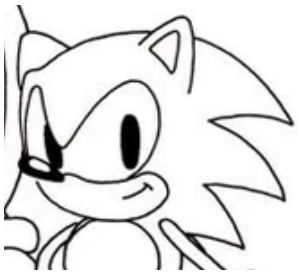
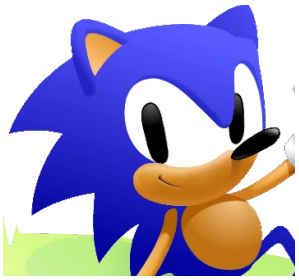


Sonic actually has 2 separate eyeballs that have been squished together, to create a distinct, unified silhouette.
Felix The Cat is a comparison visually:



Sonic's eyes have eyebags and this can be used for dramatic effect in expressions. Like the eyes of Felix the Cat, Sonic's pupil and iris are strictly ovals or often flat cylinders, not perfect circles. However, unlike Felix the Cat, Sonic's two eyes aren't always wide open.

As the series has done, many different styles of pupils have been used, in different shapes, colors and sizes. An often overlooked aspect of this is how different types can affect character presentation.
Notable examples include:

Classic “Western Style” Flat Capsules		Classic Eyeshined Airbrushed Ovals	
			
Large Oval Iris, Dark Color with Gradiant		**Small Iris, Light Color, Striking Contrast (often paired with very slim oval shape)**	

A great way to better see how the portrayal of the character communicates expression is by comparing it to nature itself and using grayscale and verifiable examples.

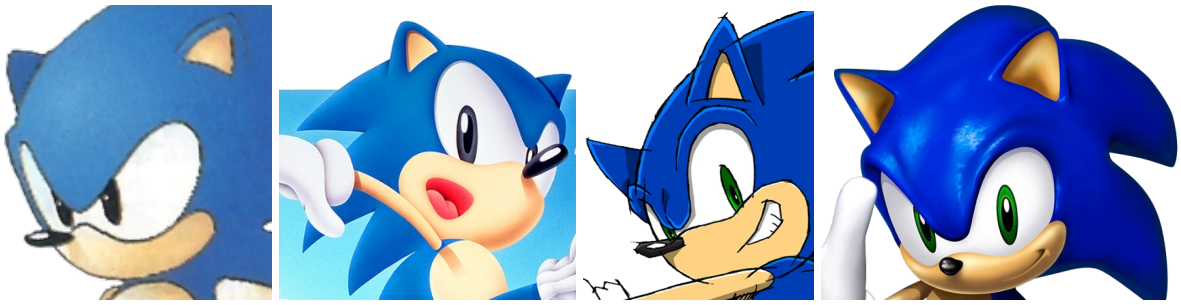
Character expression and portrayal can often depend on the type of coloring and shapes used. For example,sharper and more light colored eyes often make Sonic look more aggressive, like a predator of sorts. This can be used to exaggerate more aggressive expressions that are meant to look striking and cool.

Meanwhile bigger flat capsules and ovals with darker shades are more approachable looking due to being more circular and like the standard eyes of a non aggressive animal. This is ideal for a more standard Sonic expression.

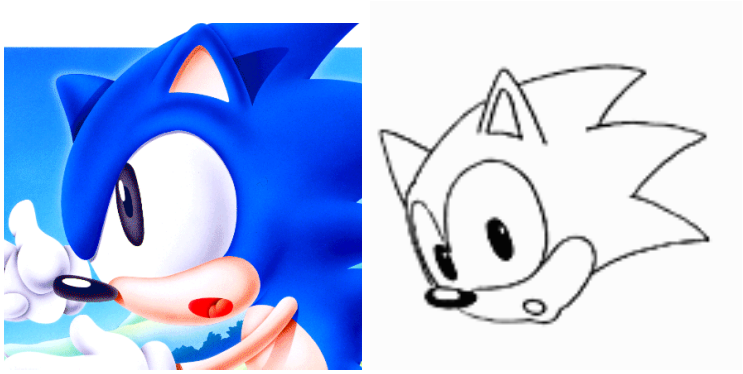
The eyes of a cartoon character are like a palette that is meant to portray an actor enjoying their performance. In order to fully showcase their performance, the two most important things of the performance are readability of the expression to the viewer and the portrayal of the emotion. This is why it is important to take into consideration what each individual type of eye can do for Sonic.

As such, it is generally suggested to use larger ovals with darker tones if coloring Sonic’s eyes, with color being used mainly as highlight to enhance the pupils through gradients.

Whilst those are the main base types they sometimes can also be mixed and matched with each other depending on the piece. Think about what would be useful for the acting and expression of the piece.



Irises and pupils can also dilate and shrink, which further helps with facial acting.



The only style of eye that is not recommended is the very realistic style seen in the Sonic The Hedgehog movies. Whilst working for the intended visual style of the live action movie, having too much realism and detail within the pupil can be distracting and uncanny.

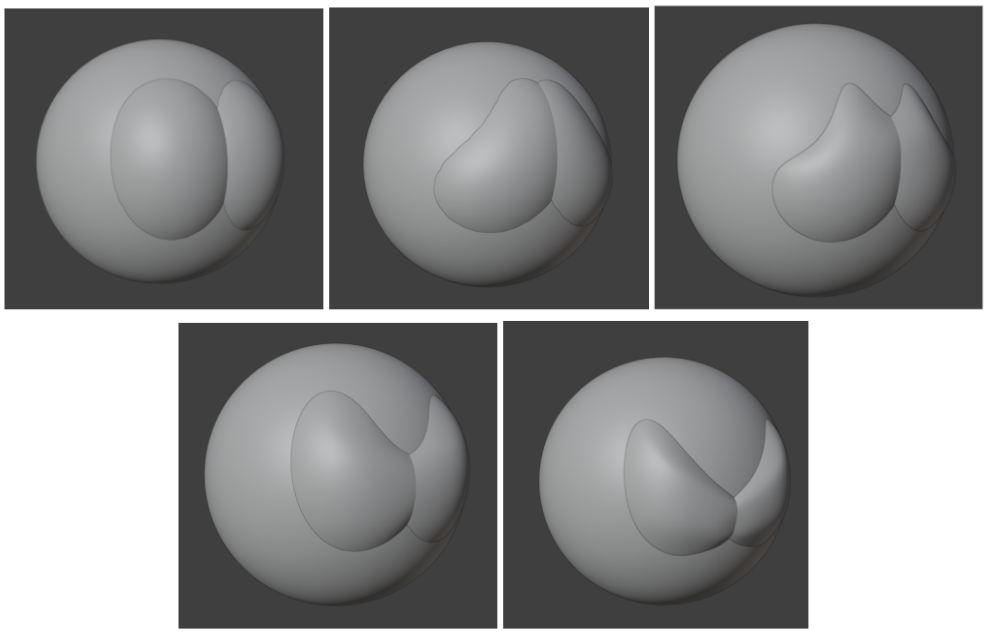
Sonic The Hedgehog Movie (2020)

Knuckles TV Series (2024)

Now, to elaborate more specifically on common misunderstandings of SONIC's eyes:

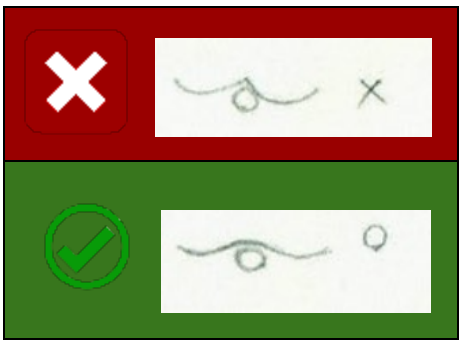
1. Sonic has two eyes that look like one.

The eyebrow will often align closely with the upper boundary of the eyeball, but when the eyebrows rise to a certain extent, the true upper boundary of the eyes should be revealed underneath. This isn't a matter of art style, it is merely an indicator of the two eyes being separate, so it shouldn't draw too much attention. This is a concept called **NEGATIVE SPACE**. In the area where nothing is present, the constant V shape is specifically created by the overlap of two circles



Do not mistake Sonic's eye being two for as a justification for having no definition around the nose giving him a "Snout".

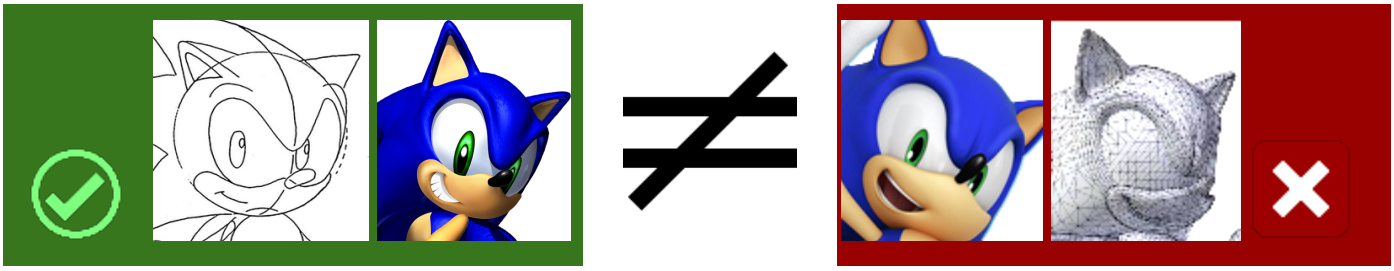
Some artists tend to take this interpretation of the two eyes almost too literally and do it in the exact same way as Felix the cat, forgetting that Sonic is different from Felix the Cat. There is this growing obsession towards more expression in Sonic, to a point where people overrun his specific character acting and expressions (Which will be elaborated in section 3).



These two eyes can be smoothed out in the middle to create an illusion of the two eyes looking like one, but they are still in fact two eyes.

Over the decades there's been a large misunderstanding of how Sonic's eyes work, and this also applies to every other character that does not have a gap between their eyes.
To summarize in a single sentence:

The characters' heads are spherical, and this is especially true with Sonic. His muzzle, his ears, and his eyes are all built on top of that.
The current game models don't follow that at all, instead his ears are built on top of his quills and his muzzle feels disconnected.



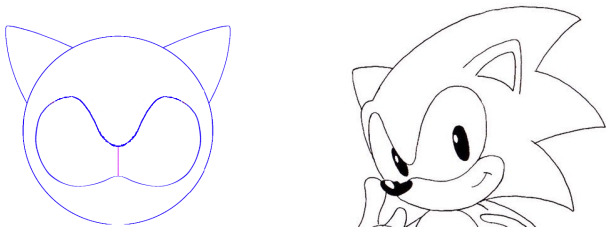
2. **The wrinkle or "butt" or "W" between the eyes is not a permanent part of the face.**

When a character is upset or tense, the two eyebrow muscles squeeze together and create the wrinkle. When the character is relaxed, it should disappear. Otherwise, the character appears to be in an endless state of excessive discomfort. This makes Sonic generally look less appealing and his expressions less visible.

In animation there are usual rules for a character to maintain its appeal. There needs to be an established personality that will be shown to the audience.

3. Sonic has a resting determined face

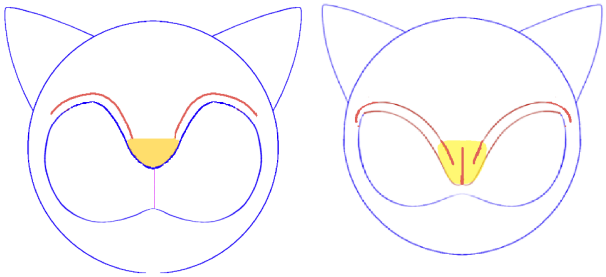
Sonic The Hedgehog is never completely relaxed. His resting face is not an overly exaggerated angry look, but rather just overall a face of determination, confidence and lack of patience. This doesn't mean Sonic is always angry, just always somewhat agitated. This is why the distinction of the "W" shaped wrinkle in the middle to the standard resting face Sonic has is important.



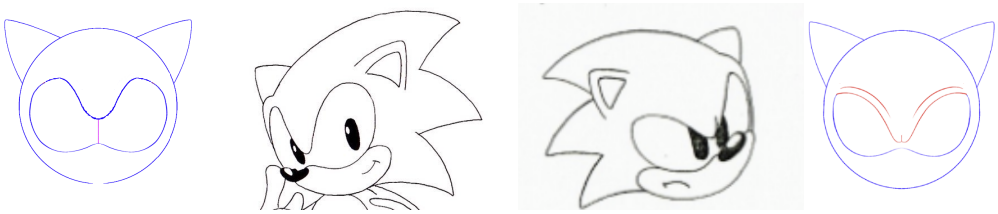
4. Sonic two eyebrows that look like one.

Much like lots of artists often mistake Sonic's eyes for being one big eye like a screen, the same happens to Sonic's eyebrows. Sonic's eyebrows are separate with each acting independently, however whenever they meet at the middle, they settle down and become flat, unless an angry expression is being forced out that tenses out the muscles.

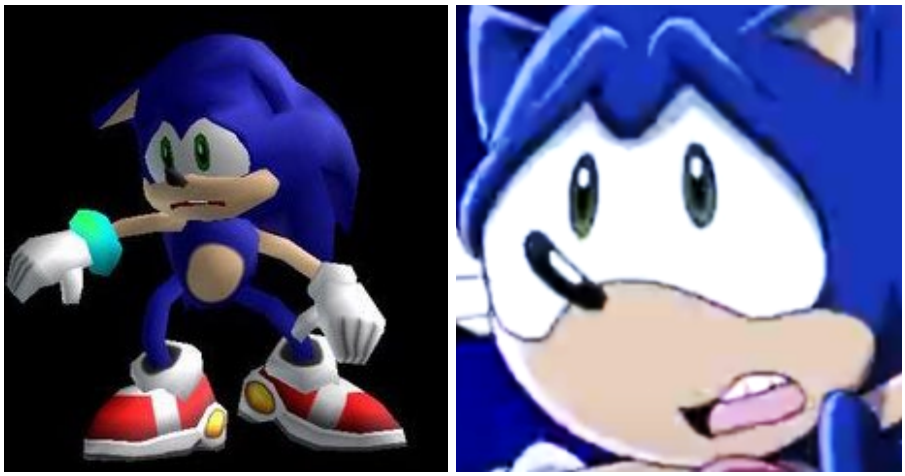
It is deceptively simple to understand how this works. Think of Sonic's two eyebrows as worms. Those worms start from the edges of Sonic's big eyes and grow in a tangent with the eye curve to have Sonic do an expression. In the middle of the two eyebrows is the forehead, which tenses up the more pressure is applied to it through facial expressions. Now if Sonic's forehead is tense, let's say due to him being very angry, then the tension of the forehead alongside the alignment of the brows will make an angry expression look even angrier, forcing lines of expression on the forehead.



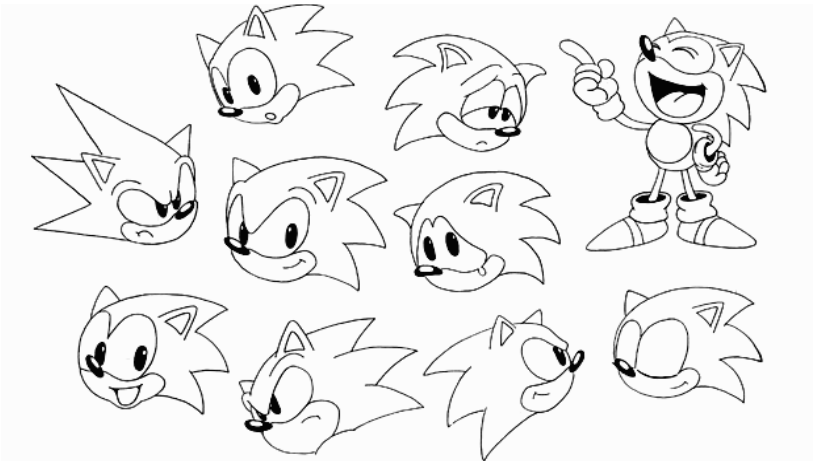
However, for stylization purposes, the brows disappear in the middle of the forehead area whenever the expression is calm, and reappear whenever the expression is tense. In 2D, the brows are purposefully not left in there for the sake of visual clarity, but they do show up in the edges of the eyes, over them.



This is the exact same reason why when Sonic does a sad expression, the V shape of the forehead alongside the negative space of the eyes maintains itself in the middle.



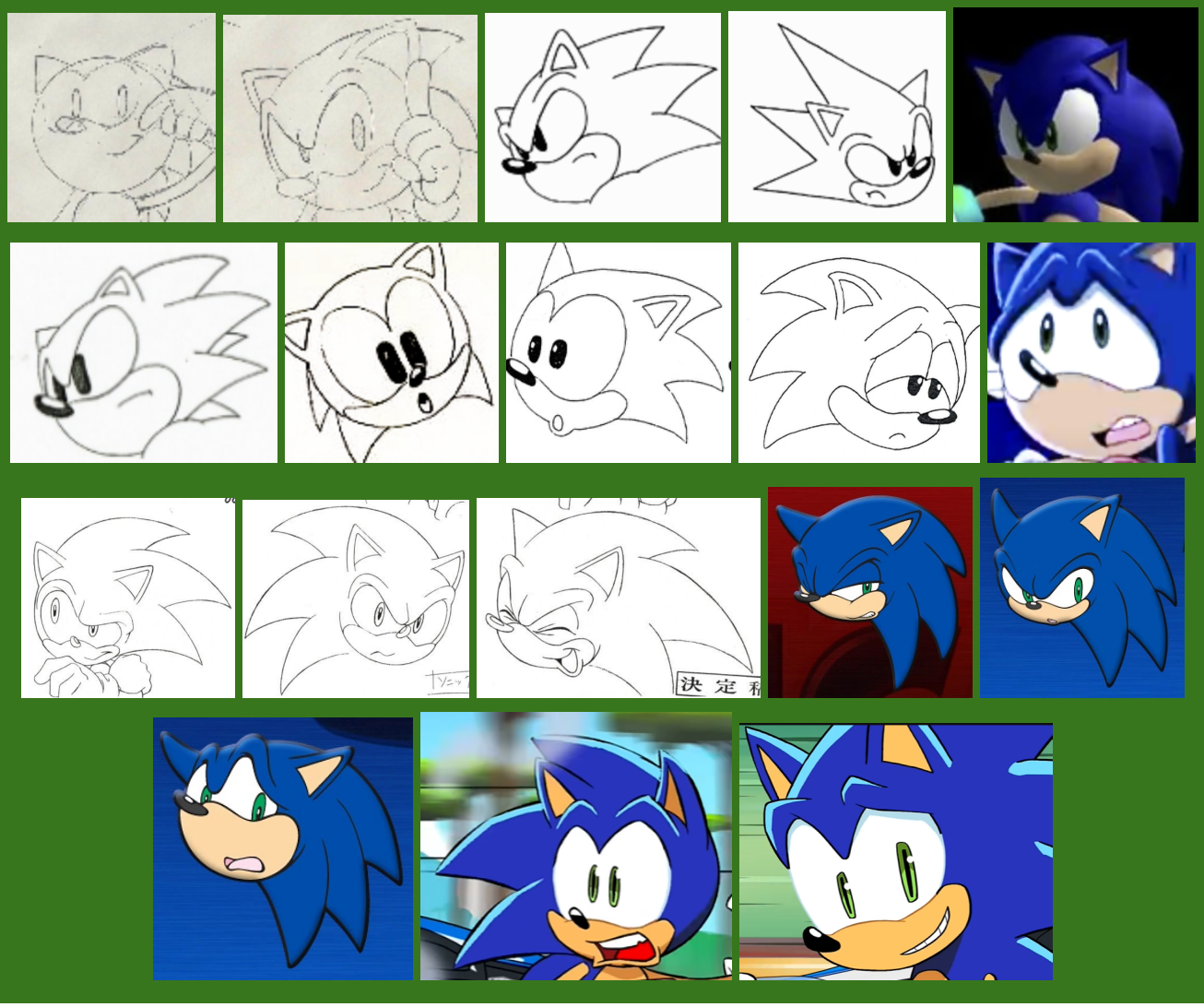
Or why this same hedgehog can also pull off other sad expressions such as the ones in Naoto Ohshima sketches. It all depends on how much you understand Sonic's cartooning to achieve his full expressiveness. The further the eyebrow is pushed in an angle, the more exaggerated an expression is.



Sonic's eyebrows aren't different from the eyebrows of a human being, they crease at the top and center. Whenever we relax and tense up the eyebrows, a similar effect happens visually. Cartoon characters are like human actors who really enjoy their exaggerated performances, which creates charm and appeal.

Regardless of what version of Sonic you're working with, these principles are valid.

USUALLY DO THIS

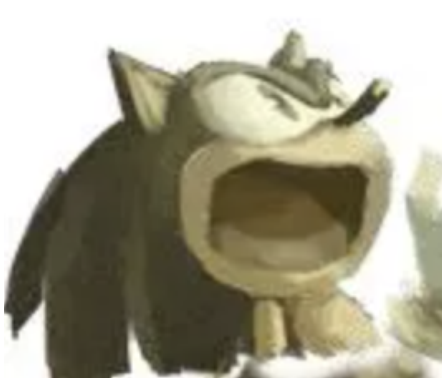


- Emphasize the cheekbone's volume in the muzzle, rather than overrelying on a lower eyelid.
- Don't make Sonic's brows too thick
- Don't put the V shape too low when using the eyebrows, and try to not make it look like an U shape.
- Don't make Sonic have an angry brow when not exaggerating expressions.
- Don't make Sonic cross eyed.
- The V shape isn't separate from the eyebrows, but rather merely an extension of it.
- The V negative space needs to exist, otherwise Sonic's two eyes look like a screen.
- The two eyes need to be separately visible and part of the circular skull.
- Sonic shouldn't look aggressive when it's not needed. Sonic is impatient but not rude.
- Sonic should look cute and happy when not under any type of discomfort due to his personality. Don't give Sonic wrinkles.
- Don't make Sonic's mouth be too big/wide in most scenarios. The mouth should be small.

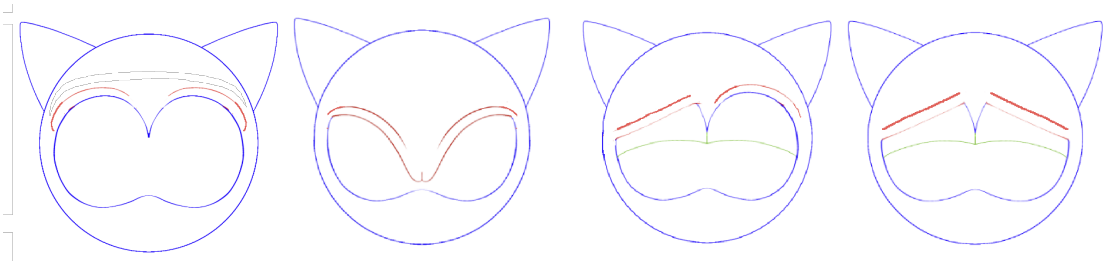
- Don’t make Sonic do expressions that would look unnatural on a human

Rule Exceptions

For the purpose of comedic effect, often these rules can be broken. Rarely ever do this for normal circumstances, but the exaggerated bizarre can be very funny, so as an artist, you will need to know when to take advantage of this. Do one million normal Sonic faces, and one or two of these.



5. Eyelids do not fulfill the same functions as eyebrows.



(Graphics by NERO.)

Eyelids cannot rotate or bend. Thus, they do not have the same functional capabilities as eyebrows, and aren't suitable as a substitute. For this same reason, making eyebrows too thick when not exaggerating an expression can cause a creepy look and is generally undesirable. However, for exaggerated expression it is okay to have thicker looking brows;

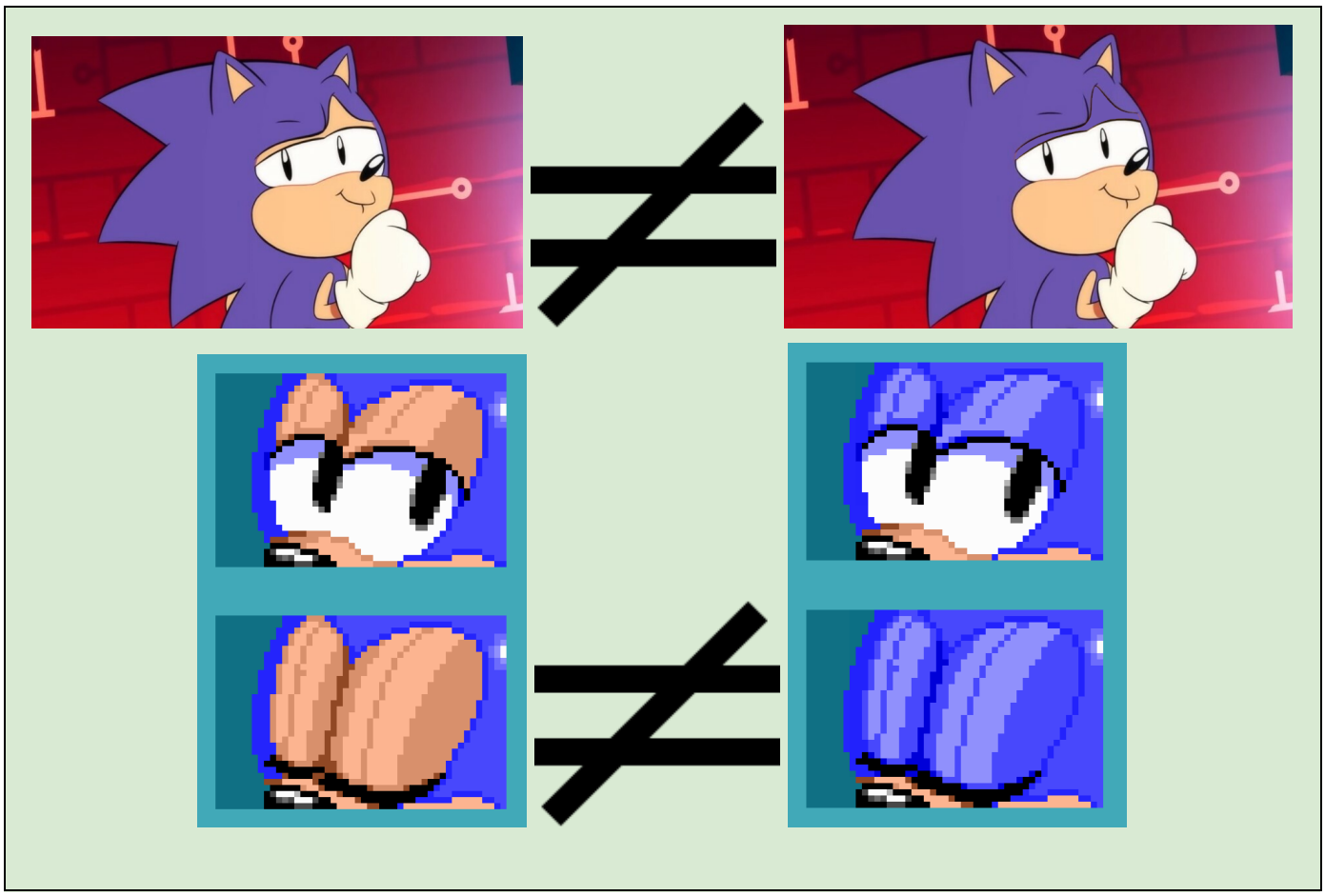
It's pretty simple when you break down the different components and understand the importance that the eyes, eyebrows and eyelids are all distinct entities working as an ensemble. With this ensemble of parts, you can create expressions with the clarity and variety of a human actor enjoying playing their character. Here are some pretty good demonstrations:

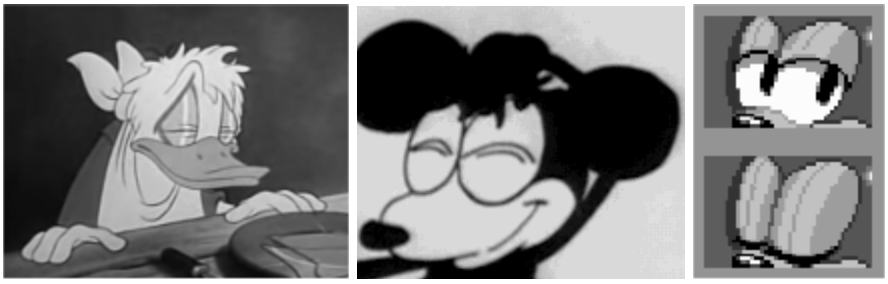
One other common mistake amongst the eyes of characters is the way that the bottoms of the eyelids are defined. This mistake only applies to official 3D models, and it isn’t as theoretically arguable as the others, so we have saved this complaint for last.

In the past, the bottom of the eyelids were defined by simple black eyelashes.
It looks very simple, fitting in with the rest of the characters’ simple body shapes.

The current 3D models remove the eyelashes, and instead sculpt the shape of eyelids as humans’ eyelids would be shaped, with a distinct wrinkle at the bottom.
This looks inelegant, and grotesque. The 3D models don't seem to be able to fully lower their top eyelids by having them awkwardly sit in the middle of the eyes with the bottom eyelids meeting halfway. This isn't how eyelids work. When representing happiness, a person closes their top eyelids lower down and their bottom eyelids should stay rested. Your bottom eyelids usually rise up when you're happy, in pain, or if you're squinting for example. This must be addressed in order to achieve full facial character acting.

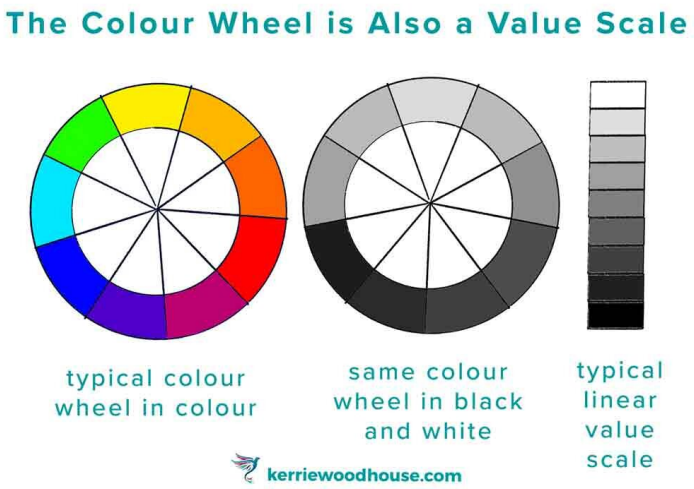
Eyelids often were portrayed in early Sonic media to be tan. This however has been changed to accommodate how other characters like Tails or Knuckles don’t have the same type of eyelid. However, the tan eyelid makes a huge difference when it comes to differentiating the brow from the eyelid. As it was previously stated, they serve different functions, so the visibility of each part of the eye is important for proper expression recognition.
While the change to blue was intentional, the same color being used in the eyelids instead of a lighter tone is generally bad for separating the eyelids from the eyebrows.





Another reason why the tan eyelid is important is because in classic cartoons, often the eyelids were colored either white, the same color as the skin, or grey to stand out from the brows due to TV's lack of color.

Also, the aspect of color value Blue is usually a color that has much more value so naturally it's darker compared to other colors which is why it might be hard to differentiate Sonic's eyelids from his brow if they are colored equally to the body color. It is a mistake of simple cartooning to make expressions and facial features unclear to the audience. Technically speaking any somewhat contrast heavy lighter color can achieve the same but we also advise against going too far away from the basic color palette since it can look a bit creepy.



Blue eyelids make the shadow or line separating his brow from his eyelid harder to see. It's why they added highlights in Sonic's eyebrow in Sonic Adventure art. It helps define the eyebrows instead of just blending in with the black outline of it. Blue eyelids are bad for expressions.

Mistakes of the "Muzzle"

As clarification, the word "muzzle" as it is used in this document refers to the area of the face that includes the nose, mouth, chin, and cheeks. Cartoon animals and especially SONIC THE HEDGEHOG characters tend to unify these body parts into a single, uniform mass.

(Sketched by CyanHyprPsychic.)

The upper boundary of the muzzle should also define the lower boundary of the eye when at rest. Thus, the top of the muzzle should rise over the nose and fall under the eyes.

However, in current depictions of SONIC and other characters, the muzzle has a very flat top that rises and falls very little. While this is an intentional choice, it worsens the expressiveness and silhouette of the eye shape and makes it so that it communicates emotions less effectively. The eyes are the biggest indicator of emotions for any character, so by essentially blocking off the eye area, you are blocking visual communication to the viewer.

With a flat top, the muzzle often looks like a bulky mask or a removable piece of a toy, even though it is a part of the face. This is obviously not desirable.

Other times, it makes the character appear to be always itchy, uneasy or uncomfortable because their cheek is raised. To be clear, it is perfectly acceptable for the upper boundary of his muzzle to interrupt the shape of his eye, if it is purposefully done to depict a facial expression more convincingly.
Don't mistake this for justifying a permanent tense cheek on the muzzle, as this limits expressiveness despite how in 3D it can be adjusted through pose brushes or rig modifications.

Good topology = efficient mesh that defines the shape and is easy to manipulate

In 2D the size is often stylized to be flatter so it emphasizes the curvature of the head, but this isn't necessarily a rule to always be followed.

As an example, if he were to grin so widely that his lips forced his cheeks to move, then it would make sense for his cheek to interrupt the boundaries of his eye.
Another incredibly common mistake is thinking that Sonic's muzzle isn't wide and is only visible on the front. When looking at most Sonic artwork and models, with very few exceptions, the muzzle is always around ½ of the character's face or a bit less.

Sideways and in ¾ Sonic also has a visible brow.

Mistakes of the Mouth

The muzzle should flow alongside the mouth ONLY if the expression is extreme enough. If you give SONIC an expression that's very tame, you can get away with keeping the default shape of his muzzle.

(Sketched by Marcy627)

(Sketched by Mello-Nova)

Sonic's mouth isn't a sticker.

Oftentimes Sonic's mouth is treated like a sticker that moves around and not something that can be stylized around in multiple angles and shapes to make character acting clearer through mouth acting. This type of acting utilises the cheeks, the extent of the lips and exaggerated emotions to portray feelings. Logistically Sonic has a mouth that is present in the middle that can be stylized to only appear in certain angles, as all cartoon characters do, yet whenever Sonic is portrayed, this is heavily limited. While it

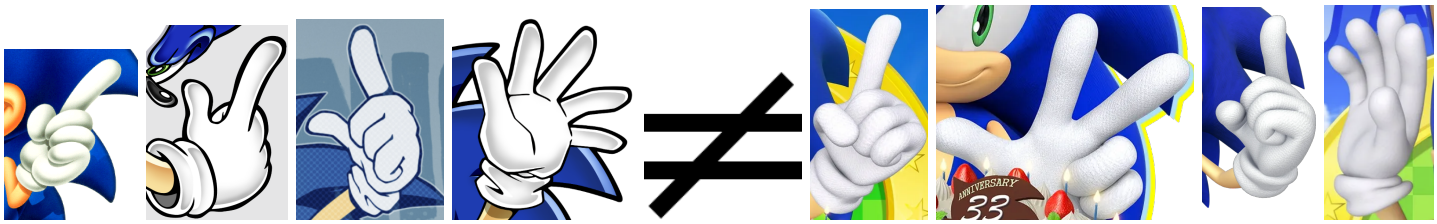
is reserved for often more exaggerated expressions, there is no reason for it to not be used at all.

Never give any Sonic character lips, or any other character designed without it.

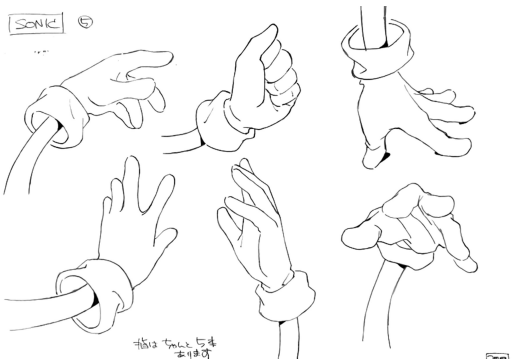
It is somewhat common for people to want to apply more detail in these characters, but simplicity is what makes them work at all. Adding lips is not only a misunderstanding of character appeal, but also of why these characters are designed like western golden cartoon characters to begin with.

Mistakes of the Hands

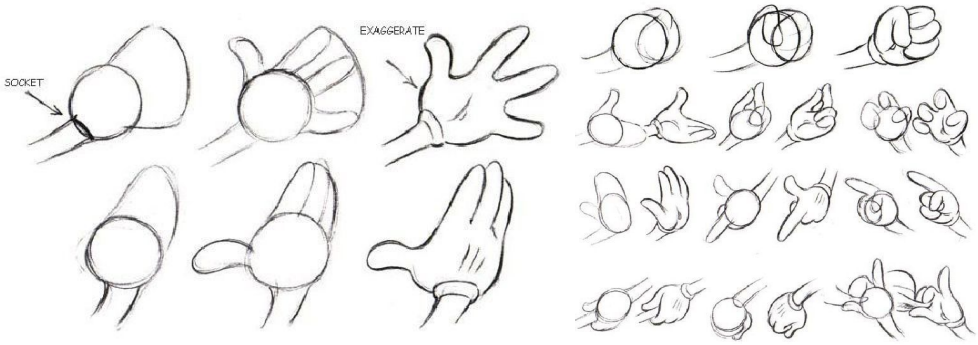
In general, the hands of the 3D models of SONIC characters are extremely undefined, as if they were rubber gloves inflated with air or water: They lack identifiable fingertips, knuckle joints, or muscle mass. **This contradicts Sonic's 2D art, regardless of the era.**



While cartoons would frequently exclude these details when drawing a relaxed hand, they would include them again when the hand is doing a pose. This is why many cartoon characters would wear gloves: The function is similar to the tight, white gloves of a circus mimic, minimizing the amount of detail to only the shape of the hand and the wrinkles that the hand's shape creates. Good cartoon hands will add enough muscular detail
to make certain hand movements appear as clearly as possible.

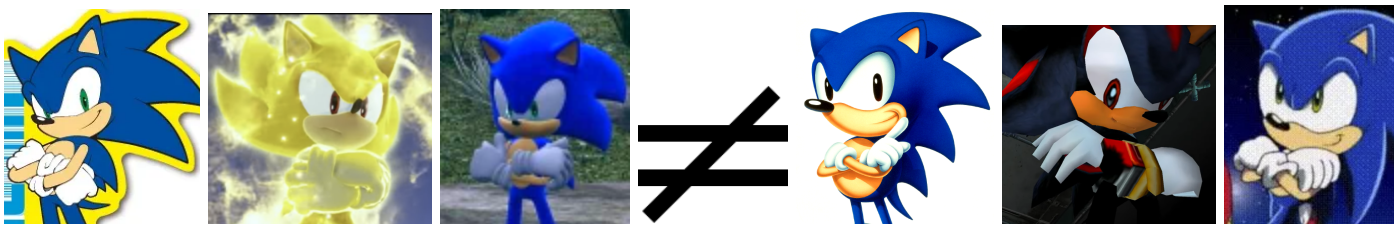


Excessive bone realism often limits the shaping and expressiveness of the characters so avoid it whenever possible



Their size can be manipulated from gesture to gesture because of SONIC's roots in cartoons and anime.
Many common actions would benefit from temporarily changing the size of the hands to avoid a sense of claustrophobia between body parts for animation. The viewer is supposed to have visual clashes between big and small shapes for motion to be identifiable. If the hands are always big, it starts resembling a human in a mascot suit.

The hands of characters need to avoid being too big, or else poses such as crossing your arms, might not be as clear to the viewer. Any and all animation should be clear to the audience for effective illustration. Keep a balance between stylization and realism. Official material may be inconsistent with this, but it's a basic principle to make motion more visible that needs to be followed.

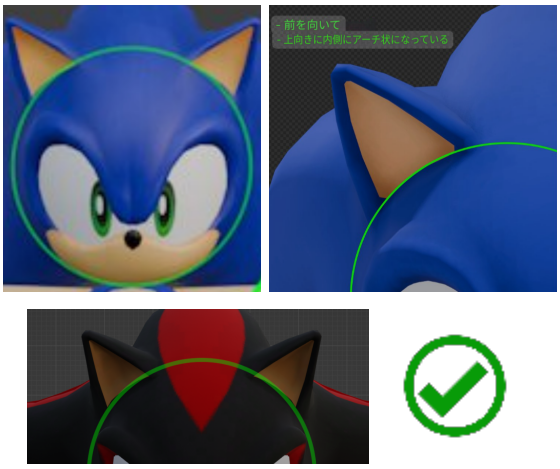


Never have the hands of the characters resemble a human mascot suit hand. Keep the size of the hands proportionate to the body.

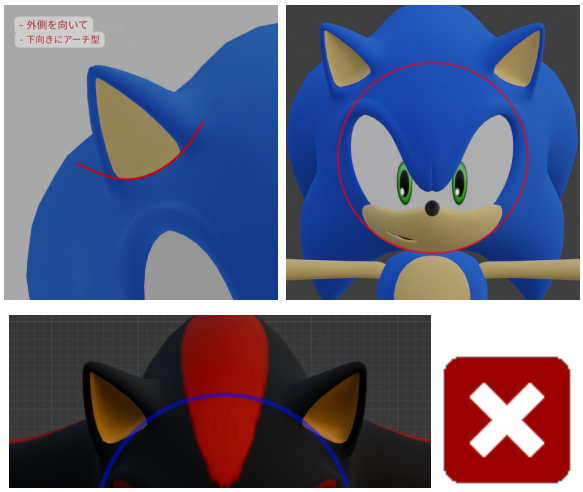
Even in fan favorite animations by “Marza Animation Planet”, they shrunk down the size of Sonic’s hands and completely distorted the model to make it better for basic posing as it can’t do any of this naturally.

Mistakes of the Ears

The ears are triangles emerging out of spheres, and the surface of the sphere should define the lower boundary of that triangle. The outside and inside of his ears circle around to the shape of the head, creating a curved cone shape.
In current 3D, often the lower boundaries of the ears strangely curve away from the rest of the head, and their triangular shape has become much, much less pronounced despite still being present.



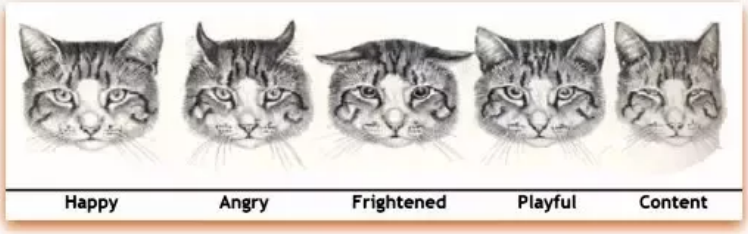
(Sonic and the Secret Rings,
Mario and Sonic at the Olympic Games)

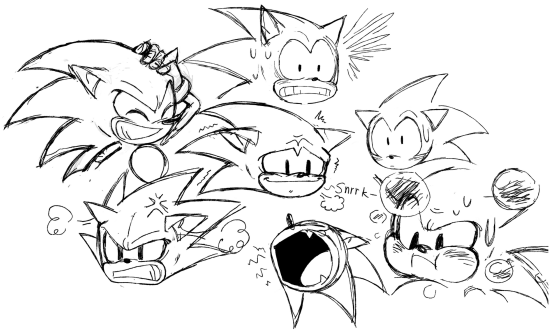


(Sonic Frontiers,
Sonic Generations)

It's also important that the ears are able to shift direction and size: They are a tool to convey emotions, similar to the eyebrows. While current 3D Sonic games still animate them a little, older games like Sonic Adventure animate them more wildly for comedy.

The ears of Sonic The Hedgehog characters operate like a mix between cat ears due to the Felix the Cat inspiration and hedgehog ears.
Sonic characters should look cute when more vulnerable and calm, but aggressive and determined when in action.



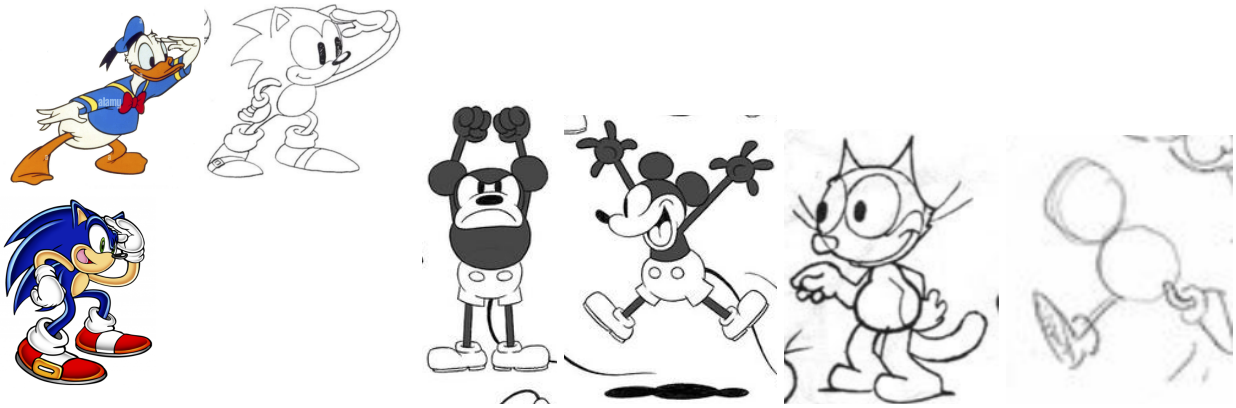


Often Sonic's ears are drawn in overly sharp, overly crooked or overly thin manners, but his ears are just simply somewhat oval shaped cones that have inward detail.

Think of Sonic's ears as simple stylized cat ears. They're meant to have these rounder edges and somewhat cute appearance while maintaining their anthropomorphic aspect. Considering Sonic was inspired by Felix the Cat, the cat ear inspiration is not surprising. Tezuka animals often have such ears as well, which may or may not be a point of reference. Similarly, that era came with the rising popularity of highly influential anime series Urusei Yatsura, which featured the main character Lum with horns in similar positions as Sonic for a cute factor.

Mistakes of the Torso

While Sonic's body is based on characters like Mickey, many of these characters are not literally ball-shaped: They are more like a bag containing a ball that sits at the hips and is stretched upward by the shoulders, but when they are proud, the structure changes so that the ball rests at the shoulders and is stretched down by the hips. To make Sonic seem like a very confident person, the ball shape of his torso would stretch downward into the legs.



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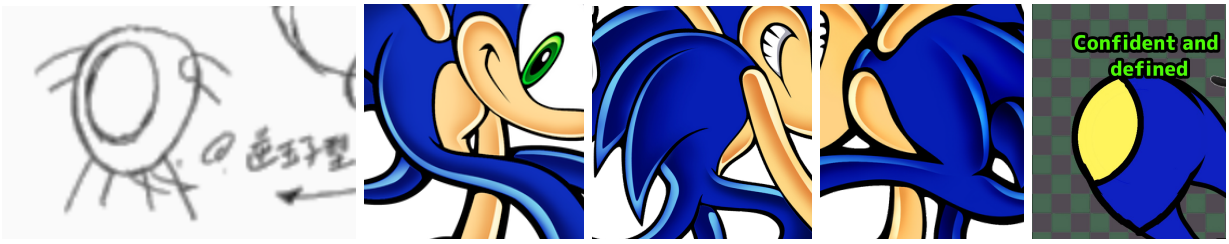
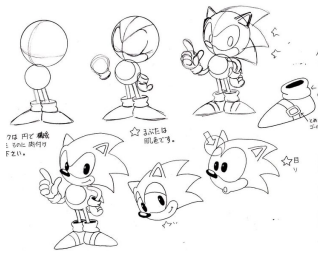
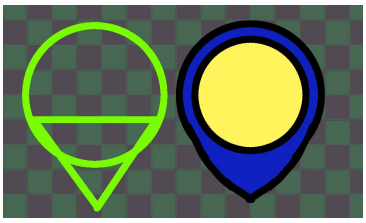


(Sketch by @ckforbesX on Twitter)

This exchange of 3D style meant that the stubbornly perfectly spherical shape of SONIC's body had lost its purpose, so it was reconsidered for what essentially is a water drop shape upside down. Due to Sonic being created in the beginning of the 3D era, the teardrop was there mostly as a necessity to accommodate for the difficulties of working with complex animations which would've been made more difficult for a character whose torso is a ball. While Sonic Team has turned the teardrop shape as a stylistic choice for a more sleek look, it changes a lot the character acting of what the original idea of Sonic was meant to be, a wild wrecking ball.

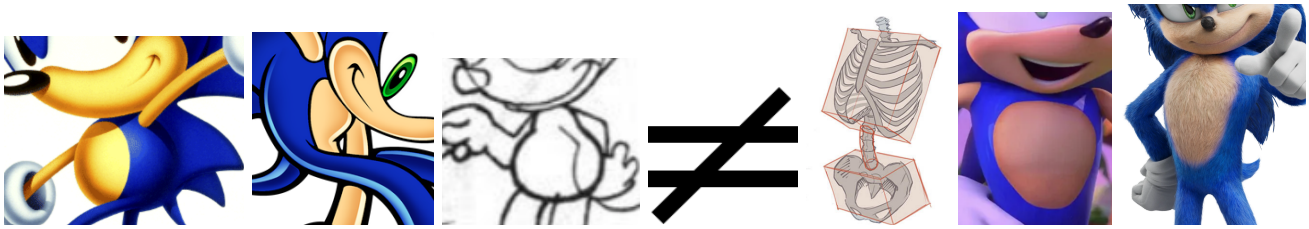



It is a rather complex topic as changing this is not exactly a mistake, but an intentional design choice that is good to be made aware of. Triangles often give off the impression of aggressiveness, while Sonic is originally meant to have the shock factor of being a softer character that impresses with his attitude. A lot of blame was put specifically on the characteristics of the design not being aggressive enough over the years, when Sonic's aggressiveness should come from his posing, character acting and branding.

Sonic could have a ball shaped torso again, and not much would change.

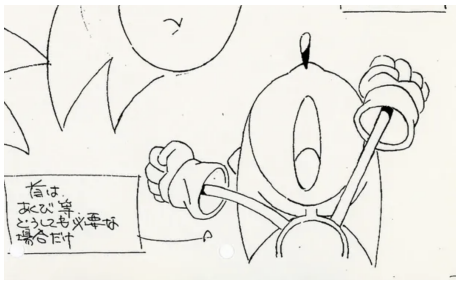
It was already common to draw SONIC with longer quills and limbs whenever it was necessary to illustrate the force of a physical movement, so to make SONIC seem more kinetic and have less of a childish appearance, these parts of his body were made longer at all times. The flexibility of "rubber-hose" limbs and quills' resemblance to flowing hair were both exaggerated to create long round curving lines that emphasized Sonic's ability to curl into a ball. The ball itself was never an obstacle to Sonic's coolness, aside from how stubby he looked proportion wise, which isn't a fault of the ball shape.

Cartoon characters don't have realistic torsos.



Sonic doesn't have a neck.

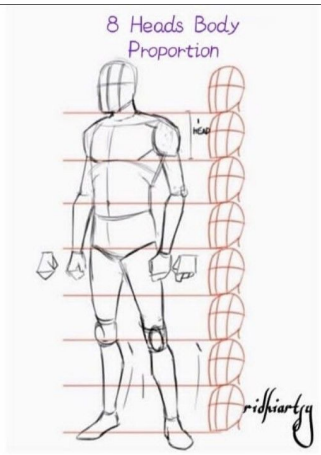
Whenever one part goes outside the boundaries of the circle, it should resemble a stretched shape to emphasize motion. That doesn't mean it's a neck, just merely filled space.

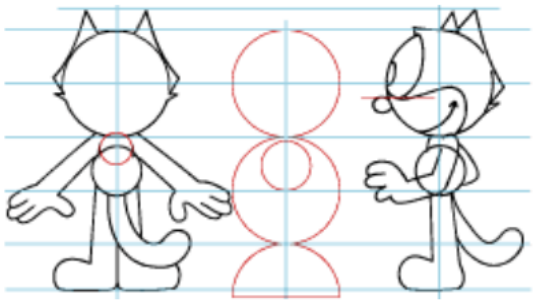


Never give Sonic a neck unless absolutely necessary for the pose. Sonic characters are entirely made of rubber, so they should never have necks.

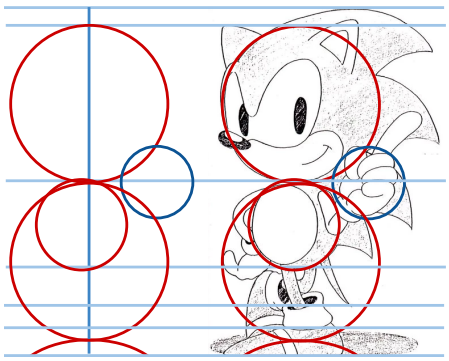
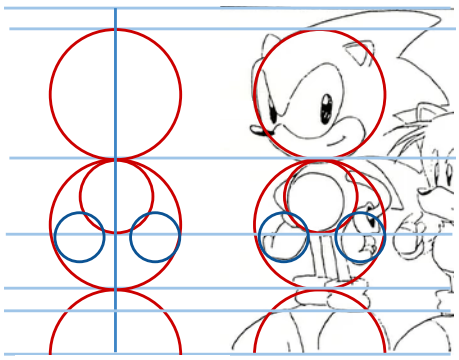
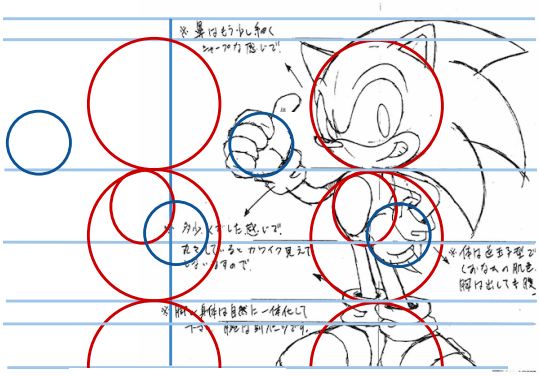
Mistakes of the Proportions & Limbs

In drawing both for realistic humans and cartoon characters using the size of the head as a unit of measurement is commonly used to measure the proportions and size of a character. A real human is typically around 8 heads tall for instance. Of course cartoon characters with exaggerated proportions may differ widely, such as the example of Felix the Cat being 2 and half heads tall.



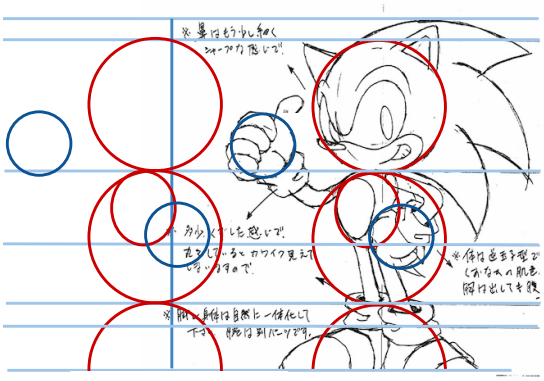
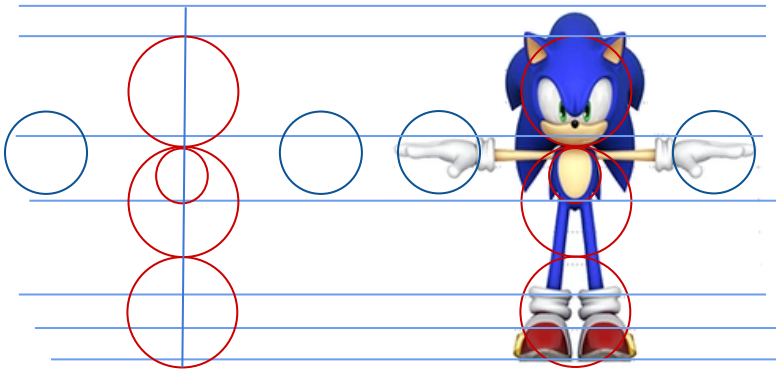


Below are examples of proportional and height guides for Sonic. (Note, Classic Sonic is listed twice, because after Sonic 1, his general proportions were adjusted from being around 2 heads tall to 2 and half for easier posing)

Classic Sonic (Sonic 1)	Classic Sonic (Sonic 2 Onwards)	Modern Sonic (Adventure Era)
		
~2 Heads Tall Body ½ Head Tall	2½ Heads Tall Body ~½ Head Tall	2½ Heads Tall Body ~½ Head Tall

You might be surprised to learn that outside of Modern Sonic's body being more of an oval, Final Classic and Modern have the same proportions!

However, lots of current depictions of Sonic go outside of this 2 ratio for a more Human-esque look. However, based on the research done, this is undesirable. Sonic's proportions intentionally try to evoque a more exaggerated character shape language wise that just doesn't work as well when stretched out or "realistically" drawn. It's as if someone took a character like Felix, Mickey or Doraemon and made them look more like a human. Sonic is still a cartoon character by design.

Modern Sonic (Adventure Era)	Modern Sonic (Current 3D CG Model)
 2½ Heads Tall Body ~½ Head Tall	 3 Heads Tall Body ~½ Head Tall

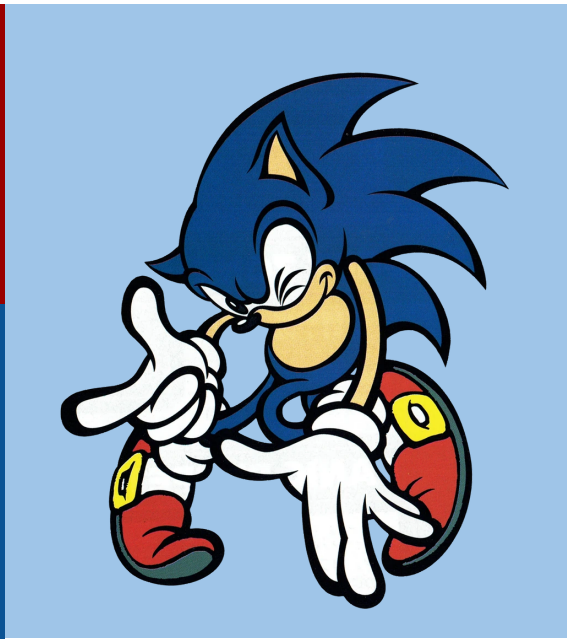
They all become especially disproportionate when you realize that the body was made the same size as the previous incarnations (½ a head) despite the rest of the proportions changing. This means that when the legs previously only took up the bottom half of the middle proportions, and the body took up the upper half. The legs are now so long that they take up nearly the size of an entire circle themselves, with the last circle being taken up almost entirely being the overly tall shoes. All of this combined with hands almost the size of the head themselves leads to an extremely disproportionate looking character.

The limbs of Sonic characters also don't function like normal human limbs with bone structures

It is a common mistake to have the limbs act like human structures with bones, which is incorrect and limits posing and actions the character can do. This applies to both the arms and the legs. It is part of the reason why it is important the the limbs aren't excessively long and out of the proportion ratio, since otherwise it takes away the impact of stretching them in animation in the first place, which is why a lot of interpretations of Sonic wrongfully do a more realistically human structure for the character.

"You do good expression. 😁the fluid boneless Sonic is the best. It's the expression that attained "a cartoon" and the good points of "manga"."

Satoshi Okano, Twitter.



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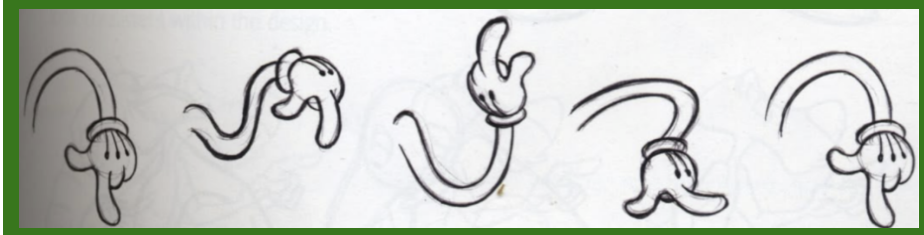
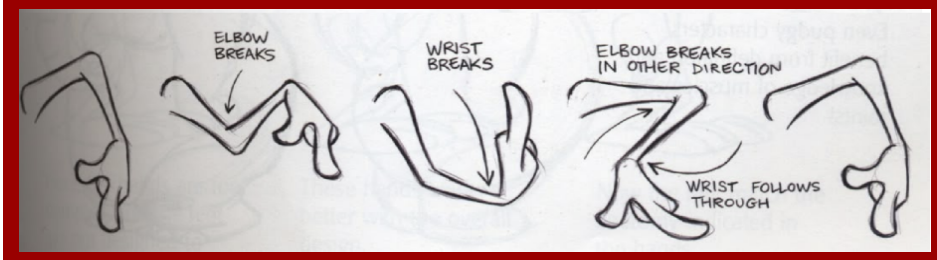
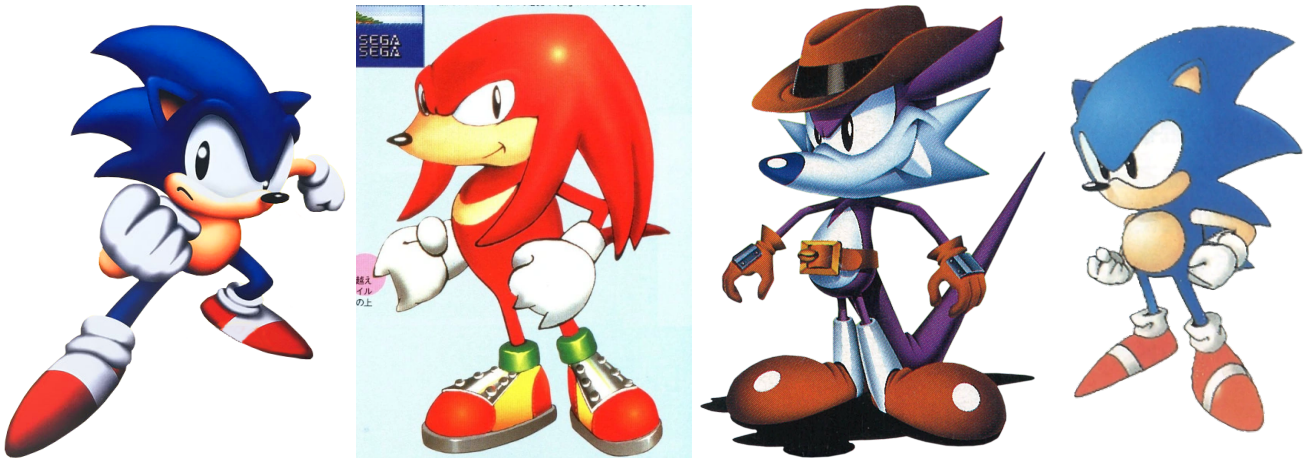


USUALLY DON'T DO THIS:



(Sketched by Disney Animator Eric Goldberg)

It should be clear that this does not mean to ***never*** have a harsh bend on a limb. It can differ depending on what is both needed for pose and characterization. Harsh bends can show strength and sturdiness. Specific action poses, characterization and shape language can all be reasons to want to use harsh bends more often on a character.



Saying to use both harsh and smooth bends in posing may be obvious, but due to overabundant harsh bend usage, on top of sometimes bizarre deformation on Sonic's current depictions, a lot of the discussion around this topic has deterred many to not use *any* harsh bends on limbs and say that Sonic characters should *never* have them which is simply not the case. It is important to know when to use each type rather than rely simply on one.

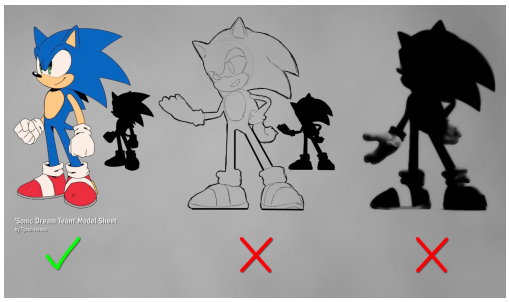
The point of this section is not to give arbitrary limitations as to how to pose, but the fact that Sonic characters should not be limited by what is possible within real life. The point is that they are commonly in motion and smooth bends can help show fluidity and give more freedom in how to pose.

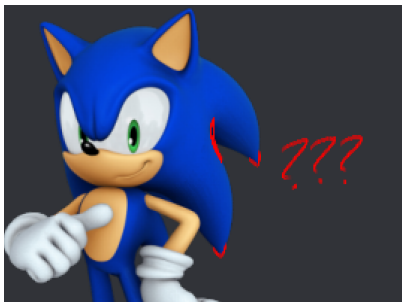
The limbs of Sonic characters are not like plastic straws but rather like rubber hoses.

Another common mistake when addressing the limbs of Sonic characters is not knowing how their arms differ when connected to their torso. Most characters are exactly like Sonic, but others have shoulders that are more similar to Shadow. This is the main difference between each approach.

SONIC	≠	SHADOW
• Sectioned off from the main body. • Shape will stay consistent no matter how the arm moves. • Negative space around the joint/no cutoff point between blue and beige keeps his colors balanced at all times.		• Joined shoulders remove that negative space, so there'd have to be a cutoff point between black fur and beige skin, which creates that awkward T-shirt or tank top syndrome. • joined with the body, which creates shoulders rather than strictly rotating around a socket. Shoulders can flex in multiple directions, so their shape will not be consistent.

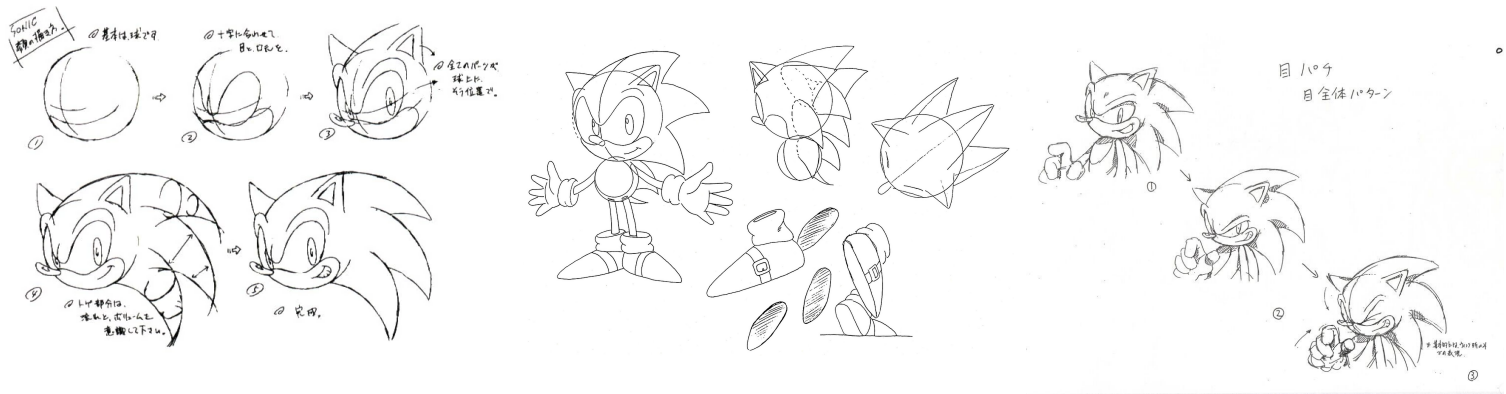
Mistakes of the Quills



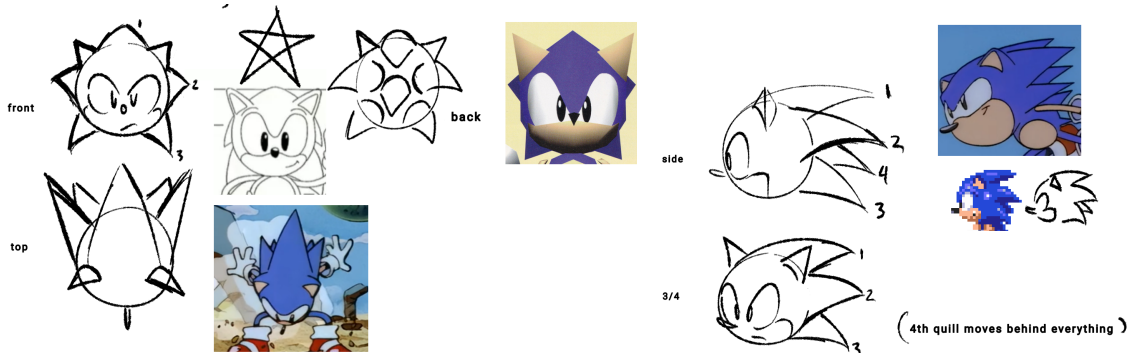


Sonic's quills in 3D presently have a strange, inflated shape, comparable to bananas or tentacles. This current shape prevents them from looking convincingly sharp, and disrupts the deliberate space between the individual quills making them unrecognizable in silhouette, sabotaging an important aspect of Sonic's iconography and design.

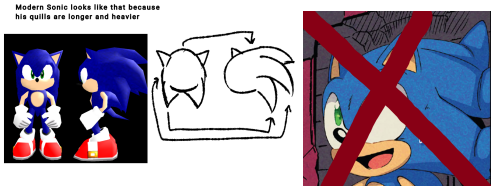
Sonic's quills are like cones that are also stuck together to Sonic's main ball shaped skull. Don't mistake the quills as free flowing shapes of his head, they're just spikes attached. While this also may have been changed with time, it generally is a worse choice than how it was originally due to how it makes each shape less distinct and Sonic's features less visible, turning curves and meshes into a singular mass, which isn't what Sonic was designed to be, or how he looks at his best, for both Classic and Modern Sonic.



These principles remain truthful for all versions of Sonic.



The functionality of Sonic's quills is overall based on how real hedgehog spike quills work. The best way to think about them is that they're flexible needles. Those needles get erect only when the animal is in most distress, but otherwise, they're loose and soft needles, bending in the direction of whatever weight is put on them in an arch. Sonic's quill spikes are no different. These are not meat and shouldn't be thought of as so. They weigh downwards the longer they are as they also have weight to them.



In order to have the quills and Sonic's silhouette fully translated to a 3D perspective, Sonic's head needs to have some readability as a circle that has the quills connected to it, as there is a quill to head separation. To illustrate it better, this concept will be referred to as "Circle Dominance".

Often in 2D artwork, Sonic is seen with a spherical head with a clear line of separation between the quills and the head. This exists in order to emphasize the circular shape of his head while having the quills on top of it.

This creates a strong silhouette for the character for whatever angle it is viewed on, as the readability of the shapes will always read as a circle with attachments. This is often stylized as a line separating the circular shape of the head from the quills in the 2D artwork.

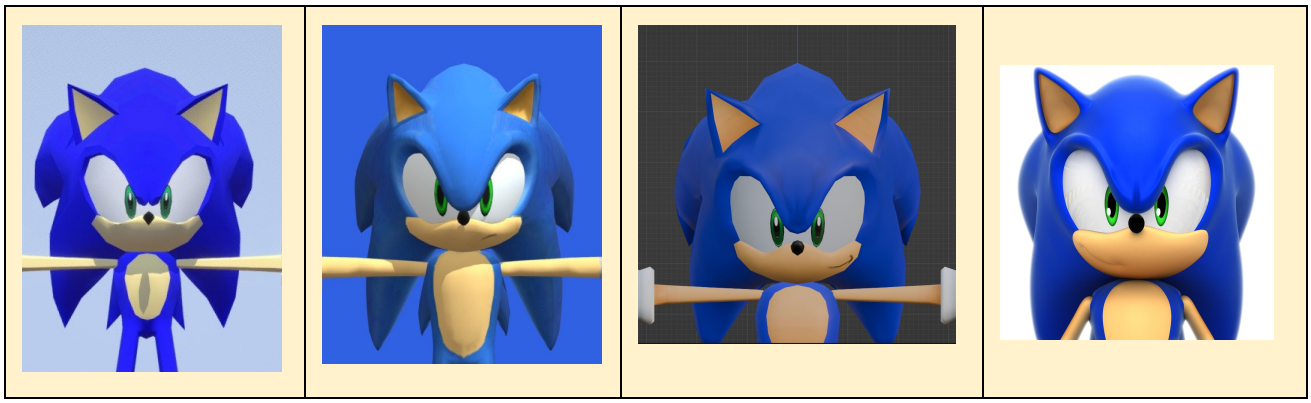
However, nowadays with Modern Technology, it has become very common to have Sonic's quills merge with his head, not creating a clear shape separation or even connection to the head. This creates the illusion of Sonic's head being like a weird star fish instead of a circle with cones.

This does not mean there can't be a smooth transition of the quills to Sonic's head, but that the shape of Sonic in the 2D illustrations is translated better and more directly to 3D whenever there is circle dominance.

Sonic's head is a circle.

Lastly but not least, Sonic's quills have a very specific star shaped formation to them that gives the character definition, no matter what angle you see Sonic in. Sonic is the star of the show, as everything circulates around him, so it's only fitting for the character to have this as a design quirk.

This feature is often misinterpreted to be something only present in older designs of Sonic, but truth is, it's not the case at all. There is no reason for one of the defining traits of Sonic to be absent from the character after all.



However as it's clearly visible, the thicker, bigger and closer to each other the quills are, the less their shape has any readability as a star at all.

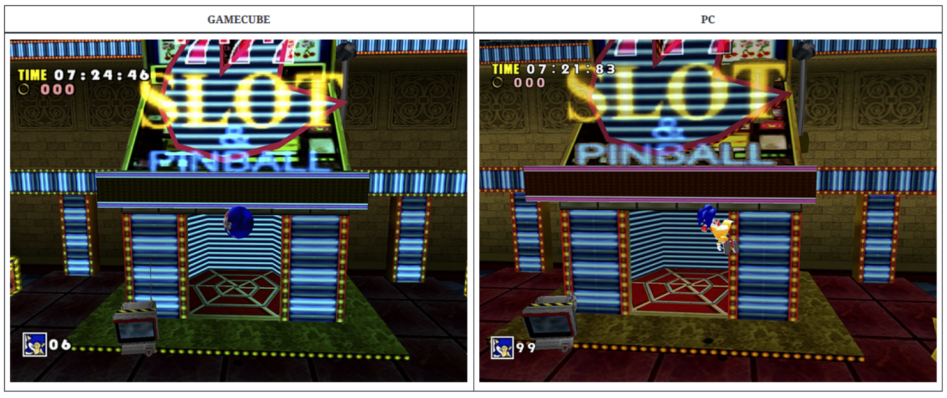
In order to avoid these issues, we will establish a few rules:

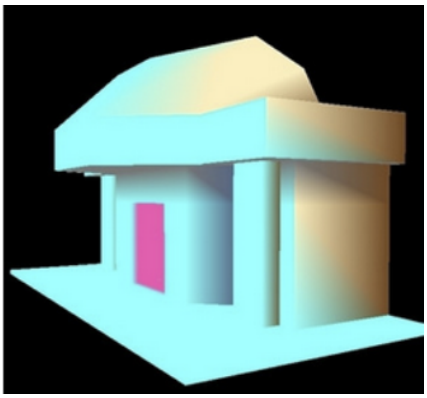
- Don't treat Sonic's quills like tentacles or bananas.
- Don't make Sonic's quills too fat as it makes them look like hanging meat pieces.
- Don't make Sonic's quills too thin as this lessens the silhouette of the 3 quills.
- Don't make Sonic's quills too close together, have them be separate from each other.
- Don't make Sonic's quills too light, so they won't be bouncing around like spaghetti.
- Don't make Sonic's quills too big, or else it creates too much visual clutter.
- Don't forget to emphasize Sonic's head to quill separation at least a little bit.
- Don't make Sonic's quills too long as it is bad for clarity of motion

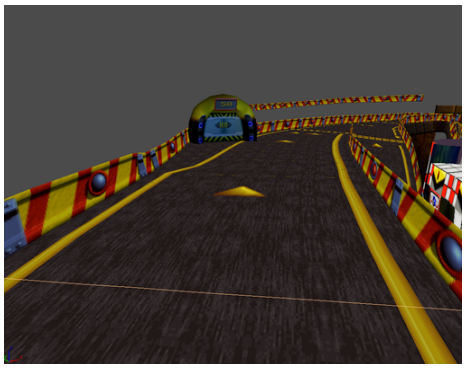
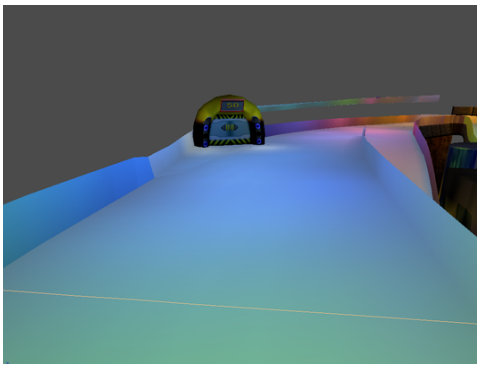
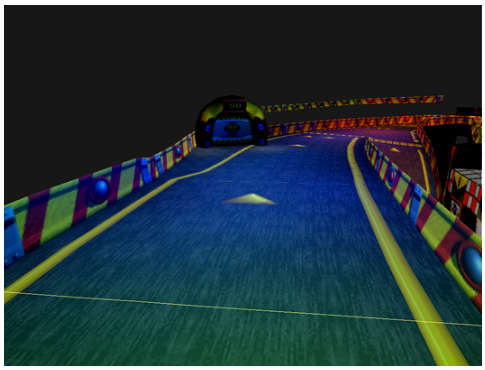
Sonic is a star!

Mistakes of the 3D (Game) Lighting

Games from the early 3D era couldn't have realistic and or realtime lighting such as ray tracing due to hardware limitations, so they used a technique called vertex coloring / painting. Vertex coloring can be summed up by hand painting different sections of an area (faces / tris of a 3D model) so it gives the impression of actual light sources being shined in the era by coloring those sources. This is why games from the 1990s and early 2000s as a whole had more creative art direction, as it was partially necessary due to limitations of its time by not just trying to 100% accurately recreate realistic lighting but being able to have complete artistic control over what areas were lit and how.





As technology developed, calculating realistic GI (Global Illumination) however became the standard with developers being able to bake real life accurate complex light interaction into models creating impressive colorful lighting with color bouncing and reflecting off each other due to the Global Illumination

You would think in the current day due to advancements in technology allowing for more complex lighting being much more easily obtainable this would be mixed with the style and specific artist catered results of the past to create new breathtaking environments.

(Examples above from Sonic Team's Christmas NiGHTS into Dreams… which also featured a mode where you could play Sonic and fight Dr. Eggman in what was Sonic's first playable 3D appearance.)

However, as years went by a lot of the understanding of the importance of specifically intended baked lighting was discarded for more bland in engine lighting, even effecting releases of older titles with the vivid vertex colors signature to the game removed.

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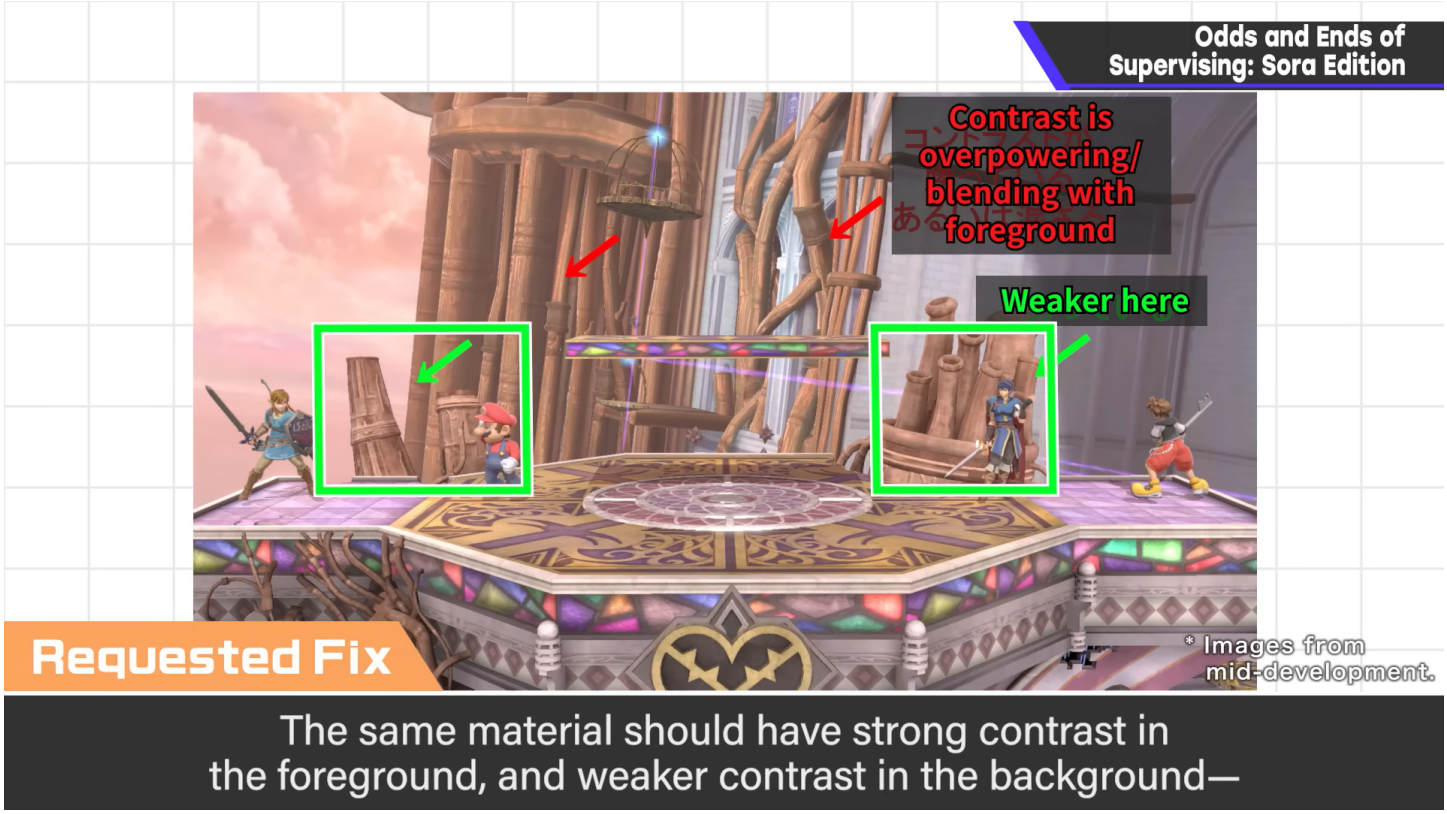
A very recent example can be seen in Apotos in Sonic Racing Crossworlds where due to the lack of GI and other types of baked lighting along with low camera light exposure makes the once bright town look extremely grey and dull.

Sonic Unleashed (2008)	Sonic Racing Crossworlds (2025)

Often modern video games and modern artwork go for less vibrant colors, but this ends up making otherwise colorful memorable environments and characters less distinct. Sonic’s look is characteristically high contrast and saturated. This is often done because it's trying to look “realistic”, but real life is very colorful! Look at the real life inspiration for Apotos, Mykonos, Greece for instance! Do not confuse attempting photo realism for a lack of color.



It is also highly recommended according to highly profiled game developers such as Masahiro Sakurai (Super Smash Bros, Kirby series) that characters have higher contrast against their environments and for games to be normally more colorful than other media for proper audiovisual feedback to not be disrupted by a cluttered image. Earlier sonic games were very good at this, however have faltered in recent years leading to a lack of clarity in visuals.

If interested it is highly recommended to take a look at these and other videos from his channel:

- Odds and Ends of Supervising: Sora Edition [Graphics]
- Supervising Art Through Retouches [Graphics]

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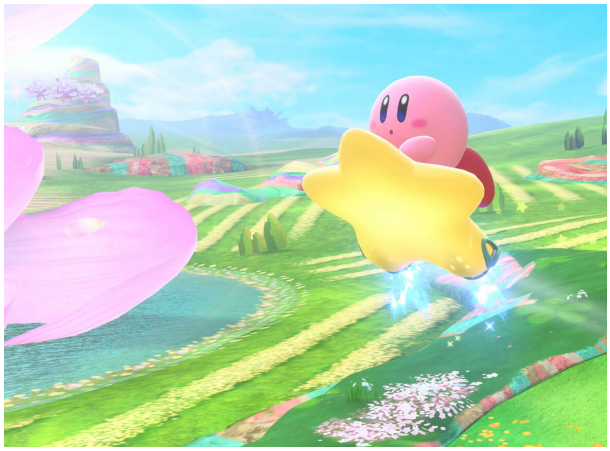
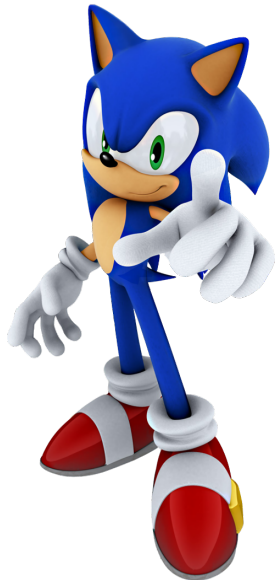
As a general point of example the Recently released *Kirby Air Riders* by Sakurai is a great example of how to make a modern video game utilizing realistic lighting, whilst also not losing touch from its colorful, surreal and photobash inspired roots. With the game's visuals giving the impression of 2000s photobash art design in the current day.



Mistakes of the 3D Rendering

Many mistakes have happened due to the age of the models they sourced from being 20 years old (originating in 2005's Shadow The Hedgehog). The quality of the rendering is extremely lacking, especially within generic "stock art", although this can be seen in games as well. The general quality of these renders has stayed generally stagnant since the early 2000s.



Sonic Channel (2006)

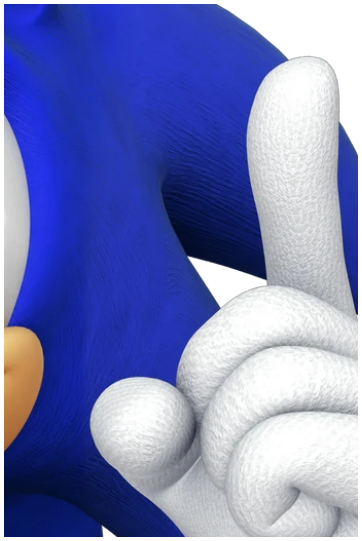
Sonic The Hedgehog 4: Episode II (2012)

Sonic Racing: Crossworlds (2025)

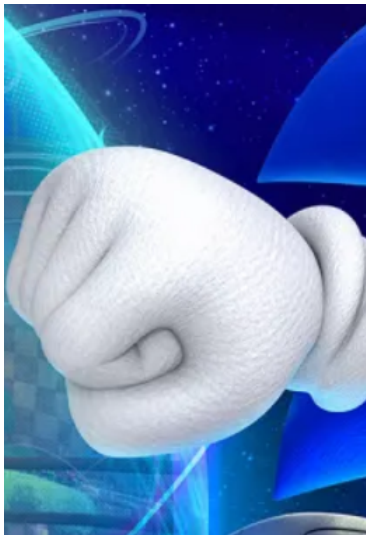
The mistakes of the rendering can be generally categorized into 3 parts: Texturing, Shaders and Lighting.

Texturing can be described simply as the images used to add detail to a 3D model. While Shaders controls how the model and textures interact with the Lighting.

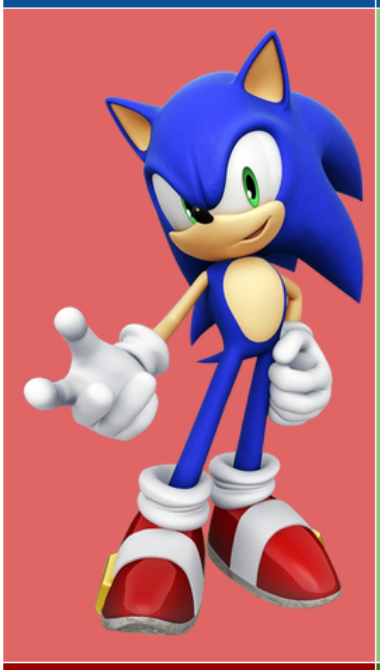
The Texturing and Shaders used for Sonic are very bizarre and uncanny, with extremely rough rubbery looking cloth as well as equally rubbery fur / quills that both also have extremely harsh bumpy and scaly looking textures. The cloth texture in particular stands out as odd looking as it hardly resembles the look of a fabric with distinct knit patterning.



Sonic The Hedgehog 4: Episode I Render (2010)



Sonic: Racing Around The World (2025)

Sonic Stock Render (2010s)	Sonic Unleashed (2008)
	
✗	✓

Mentioned prior was the fact that while these problems are practically always seen in stock art. Games however can often have much higher quality renders. This is due to them being made by Marza Animation Planet.

Marza Animation Planet was first founded in 2005 as “Sega VE Animation Studio”, and went through another name change before finally settling on Marza Animation Planet. While their name no longer has SEGA in their title, they are still fully owned by SEGA.

They are a CG studio most famous within Sonic for doing the pre-rendered cutscenes in games such as *Sonic Riders*, *Sonic Unleashed*, the Storybook series games and the *Night of the Werehog* animated short.

However, besides doing these animations they are the ones who often make the renders for the big new titles and the quality between them and the “Stock” renders is extremely apparent.

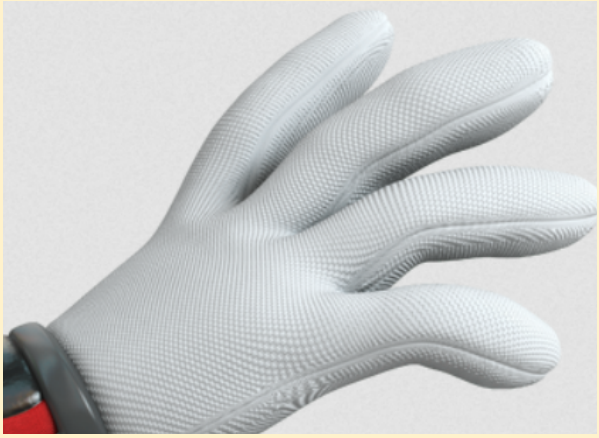
From the very beginning of their career with Sonic on the first Sonic game they worked on *Sonic Riders*, A massive jump in rendering quality can be seen. Marza

renders have higher quality, more organic material work and better texturing on the Gloves. With a more realistic fabric texture and even cloth pattern seams showing exactly where the gloves were contextually stitched together.

Similar details of better quality materials and more fitting fabric textures can also be seen in *Sonic Unleashed/World Adventure renders*, even if without the gloves seams. However the last time the higher quality texture work on the gloves would be seen in 2010 within *Sonic Free Riders*, despite every character in that game being given the higher quality glove textures on what otherwise was the typical stock render models.

None of the characters kept these higher quality textures on “stock” models, outside of Jet The Hawk. Despite this Jet’s most recent appearance in *Sonic Racing: Crossworlds* shows Jet with fabric texturing downgraded to the texturing used in the 2005 era stock models, which is visibly lower quality for no real reason.

Stock Render(~2010)



Sonic Free Riders(2010)

Sonic Racing: Crossworlds (2025)

Outside of lowering the quality of texture work for “stock” renders and games that use that style. Sometimes renders can be found being used based on existing prior renders with worse lighting, materials and posing that makes them more inline with the “stock” renders and oddly enough even slightly worse posing. This can clearly be seen in an example below with a worse quill silhouette and smile posing:

All comparisons so far have mainly shown older rendering comparisons from the 2000s and 2010s showing that even at the time whilst more acceptable due to their age and the state of CGI at the time, the “stock” renders were average at best compared to the output capable by Marza.

However as we enter the 2020s, the franchise still using the same style of rendering that was barely getting by in the past is still being used is quite bad and makes the entire franchise feel cheap and stale.

Before continuing it is important to touch upon something. As the “stock” style of rendering is continuously criticized for being “outdated” and “old”. It is very crucial to drive home the difference between the “stock” style and the style of early CGI talked about earlier in [2.2 - Into Silicon Dreams]

While the Silicon Dreams style is based upon early CGI it does so to its strengths and specific appeal of trying to be as *CG* as possible, with its extremely reflective surfaces, perfectionate rendering and general sense stylization. This style of visuals going for heavy stylization and abstraction is known as NPR or "Non Photorealistic Rendering". For instance in *Sonic Heroes'* promotional renders, they purposefully chose to stick to a very NPR look in regards to rendering making the characters have the same sort of clean CGI and airbrushed inspired look of the classics. However, the "stock" models with their heavily detailed more "realistic" texture work with fabric textured gloves, and dirty textured soles, and attempts at more "realistic" materials make it clear that it is attempting to go for PBR or "Photo Based Rendering". *(Sidenote: besides the general style of PBR there is also the specific shader workflow of PBR used in modern video games, the aforementioned PBR description as well as further examples will be talking about PBR as a general style of rendering then the other more technical definition).*

There is not a problem with PBR, all of the Marza renders shown off are rendered in such a way to great effect. It is also important to note that "Photo Based Rendering" does NOT mean that the look of the image is fully realistic to the real world. It only means that the way objects in a scene are lit act more realistically to light. As mentioned prior in Mistakes of the 3D (Game) Lighting. Sonic is a heavily stylized franchise and should be presented as such, even within a PBR setting.

The problem however, is that the "Stock" style is desperately trying to be realistic but failing to reach that look.

The both styles of rendering both NPR and PBR each have their own strengths within their styles. However the "stock" style SEGA has been using does not do its job well at being realistic, but also not abstracted enough to fit well into being stylized. It rather falls into some sort of strange uncanny valley.

Non Photorealistic Rendering Example: Sonic Heroes (2003)	Current “Stock Style” Sonic Promotional Render (2022)	Photo Based Rendering Example: Sonic Riders Zero Gravity (2008)

This all being said, the reluctance to lean on SEGA's own internal studio continuously putting out fantastic results and instead settling on using outdated frankly ugly setups can only be described as extremely confusing.

As seen since their beginning work on *Sonic Riders*, Marza has always been ahead of the curve regarding CGI. Marza in fact has such a good reputation that they are often hired to do work on projects outside of SEGA properties because they are known for such high quality work. They not only have worked on movies for other iconic franchises such as *Final Fantasy* and *Resident Evil / Biohazard*, besides their known work on the Sonic movies

But they have also been hired to do work on other companies' video games projects. This includes not just animation work **Sony**'s *The Last Guardian* and **GungHo Online Entertainment**'s *Ninjala*. But also the Sonic franchise's long standing video game icon contemporary *Super Mario* from **Nintendo**.

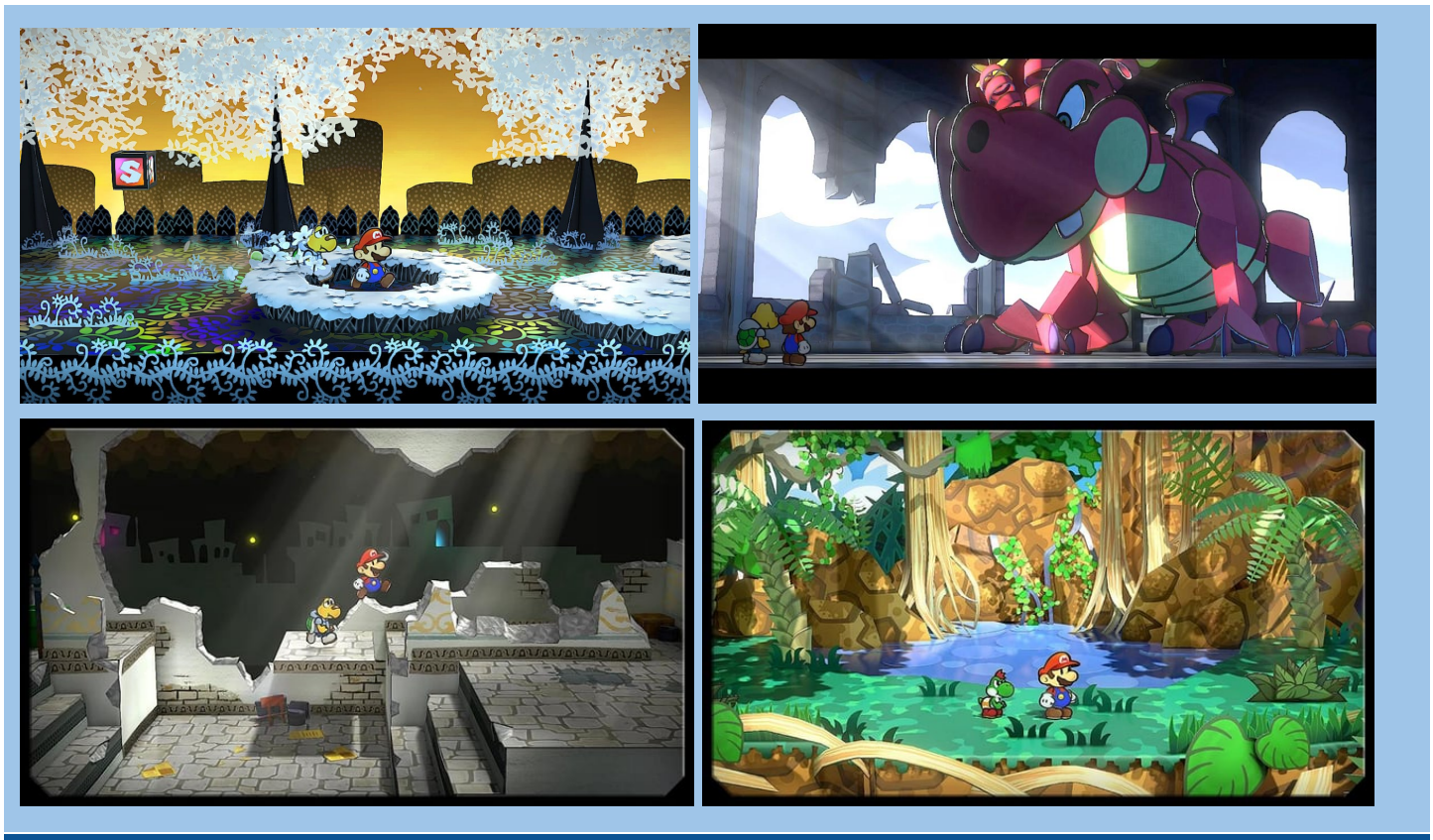
Mario Kart 8 (2014) by Nintendo Co. Ltd.

Contributions to renders by Marza Animation Planet; Source: https://www.marza.com/en/works/article/961/

The breathtaking promotional 3DC renders of *Mario Kart 8* that Nintendo would use as the *Mario Kart* franchise's own stock art for over a decade was worked on by none other than SEGA's own Marza Animation Planet.

However, this wasn't the only time Marza had worked on a *Super Mario* game. Both *Paper Mario: The Origami King* and *Paper Mario: The Thousand-Year Door (Switch)* both games were praised for the visuals, especially regarding the lighting which was in one by Marza Animation Planet. This is incredibly interesting as Marza has only ever done help with in-game lighting for these two games, not even any internal SEGA games have gotten this treatment.

However, as per usual with Marza their work speaks for themselves:



Screenshots from *Paper Mario: The Thousand-Year Door (Switch)* by Nintendo Co Ltd. and INTELLIGENT SYSTEMS.

Lighting production by Marza Animation Planet; Source: https://www.marza.com/works/article/66782/

The point of bringing all this up is to drive the point home that SEGA's Marza Animation Planet is a major forerunner within CGI, doing some of, if not the best work in the industry. However, despite this SEGA has majorly underutilized their own studio when it comes to their flagship franchise, both for in-game and promotional usage.

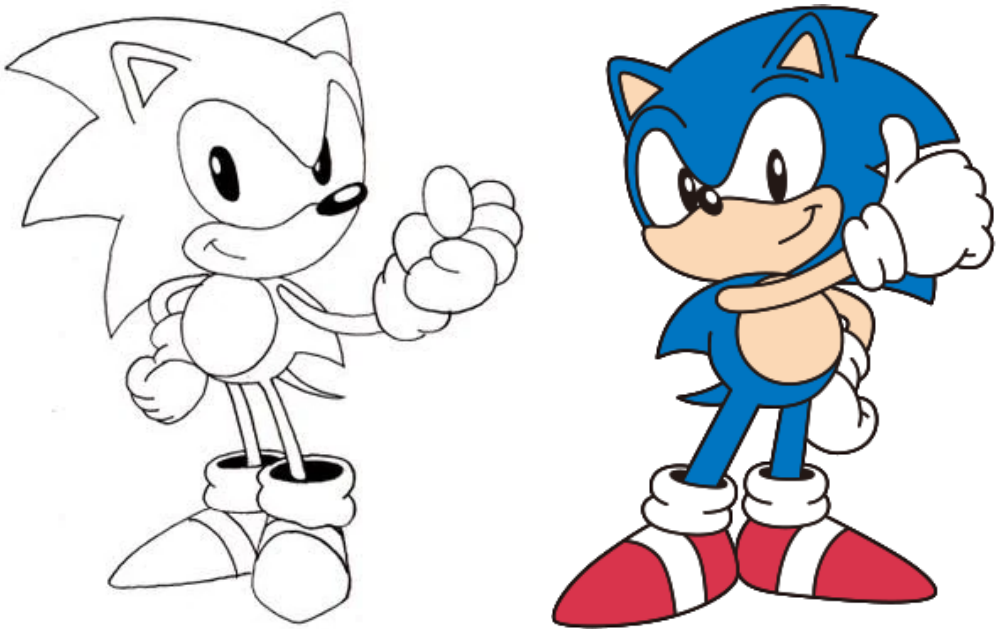
Marza should stop being held back for their own work and preferably if possible have more involvement within the games themselves.

3.2 - “Nu-Classic Sonic” Mistakes

In *Sonic Generations* (2011), the concept of “Classic” Sonic was officially established to refer to aspects of the franchise’s identity (such as character design) from before the release of Sonic Adventure. Classic Sonic has become a mainstay, defining a new subseries of “Classic Sonic” games such as *Sonic Mania* and *Sonic Superstars*, and appearing as a guest character in “Modern” games like Sonic *Forces*.

In the process of bringing back Classic Sonic, a new standard was created to ensure that he would remain distinct. This standard, intentionally or otherwise, makes changes that detract from the appeal of the original Classic Sonic look. This section will be dedicated to those mistakes.

The online community has coined the term Nu-Classic Sonic to distinguish this new standardized appearance of Classic Sonic from Sonic Generations onward as a separate entity from the original appearance of Classic Sonic in the 1990s. Going forward, we will be using this terminology.



To begin, the most notable difference between Classic Sonic and *Nu-Classic* Sonic is the way characters are presented.

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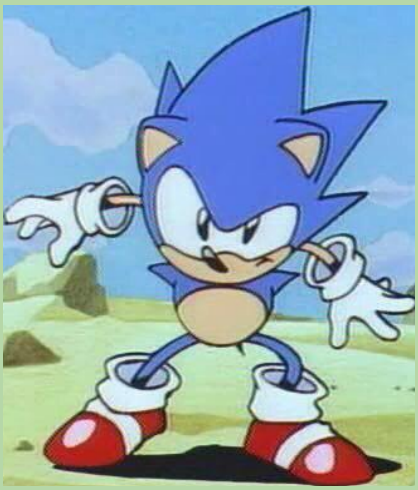
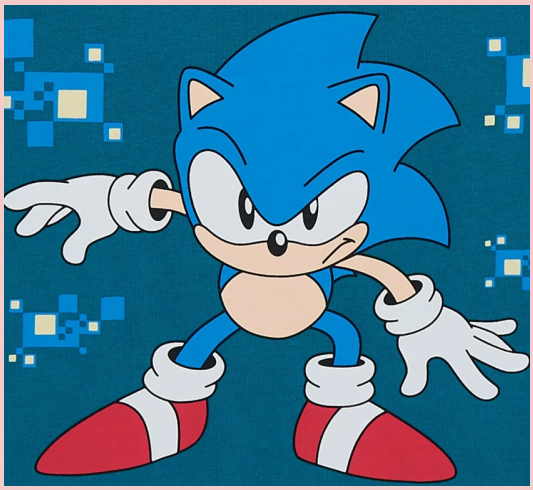
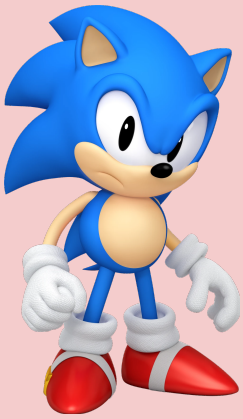
	
Sonic CD (1993)	Classic Sonic Stock Art (2020s)

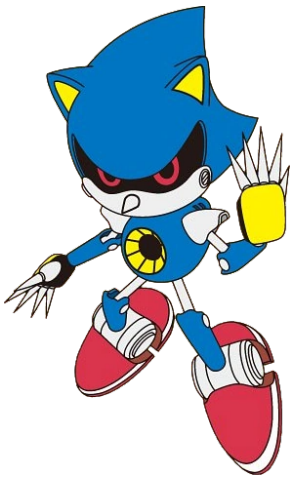
Outside of general common issues all previously listed out within [3.1: Redundant Mistakes](), *Nu-Classic* has its own unique issues in presentation. The largest of them all are in character proportions.
While "Classic" characters are typically somewhat shorter than "Modern" characters, *Nu-Classic* depicts characters with ***extremely*** short and ***very*** thick limbs (especially in 2D art). All of these changes on top of the overly large hands and clunky feet make *Nu-Classic* characters much less "cool" than they should.

✓	✗
	

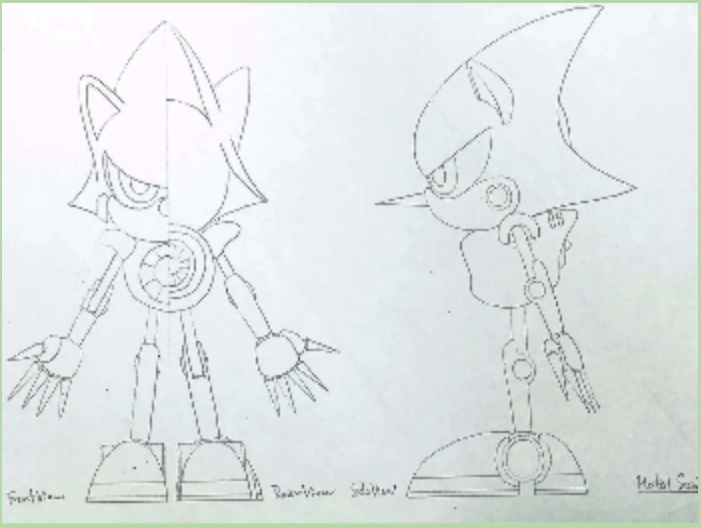
This all can especially be seen below with Metal Sonic:

Knuckles Chaotix (1995)	Sonic Generations (2011)

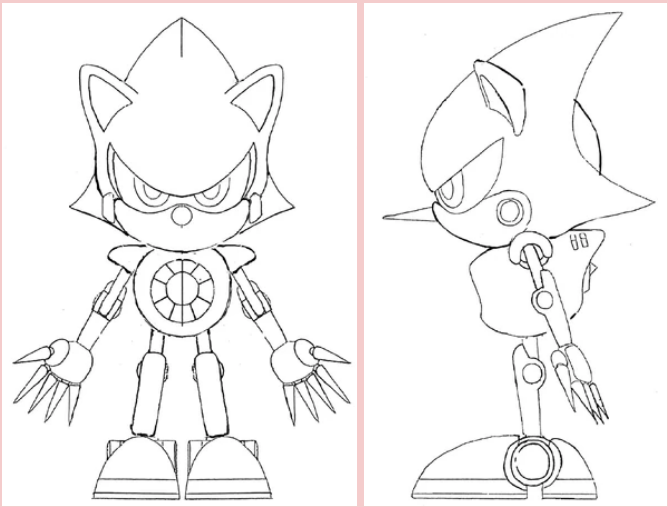
Rather than Metal Sonic feeling threatening and imposing as the character should, the Metal Sonic seen in Sonic Generations has overly small stubby “chibi” proportions that make him feel extremely silly and unthreatening.



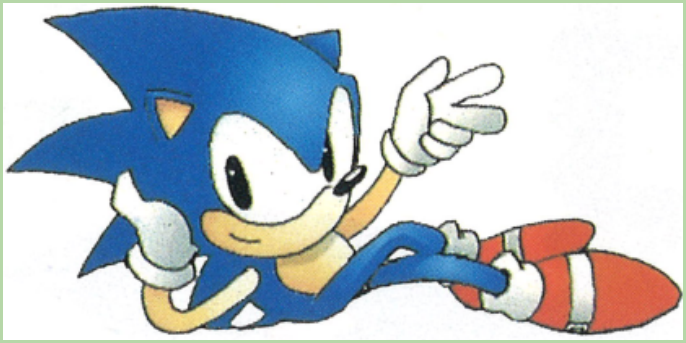
Whilst especially bad for a character like Metal Sonic who's supposed to be a threatening, alien-like machine. This majorly affects all of the characters with these "Nu-Classic" proportions. Sonic was designed to be versatile in appeal. By making the character overly stubby a lot of his unique identity gets removed as a "cool" character. With even his model sheet drawn from his original Sonic CD appearance to be smaller and stubbier, making him appear almost comically shrunken.

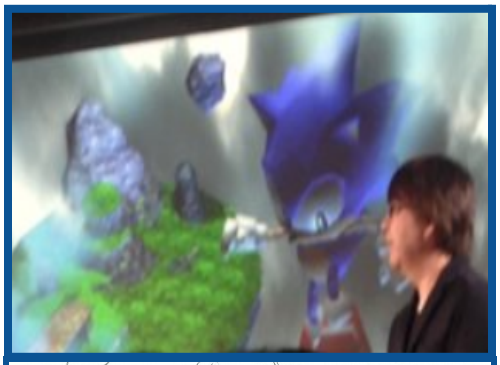


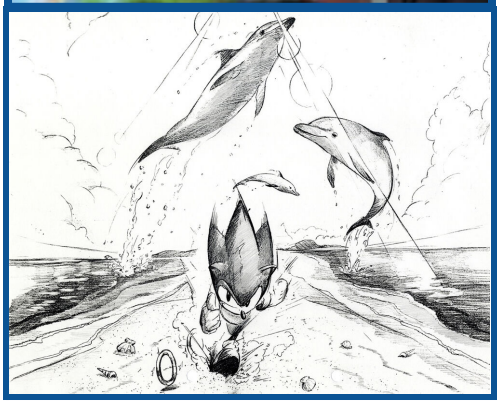
1990s Metal Sonic Model Sheet
(Brightness Adjusted for clarity)



Current Classic Metal Sonic Model Sheet
(Front and Side)

	
Sonic The Hedgehog 2 (1992)	Sonic Generations (2011)





Outside of the character's proportions, the general size of the characters themselves (especially when contrasted with "Modern" characters) is extremely off.
An important thing to remember is that the idea of redesigning the cast in *Sonic Adventure* came midway through development, with the game originally going to use the "Classic" Designs. With lots of concept art and even full 3D prototypes being made (examples seen on left).
The redesigns in *Sonic Adventure* were merely simple design changes that were not supposed to be signifying any other changes for the character or the world they inhabit.

It can be seen within the concept art of *Sonic Adventure*, that Sonic's redesign was adjustments of the Quills and torso mostly. Whilst the line art was not 100% final (Modern Sonic in the image is missing the soles of his shoes), it is otherwise almost exactly what became of the final design that appeared in *Sonic Adventure*. It is very important to note that while "Modern" is **slightly**, taller this mostly comes down to subtly increasing the character's scale otherwise the proportions are practically the same.

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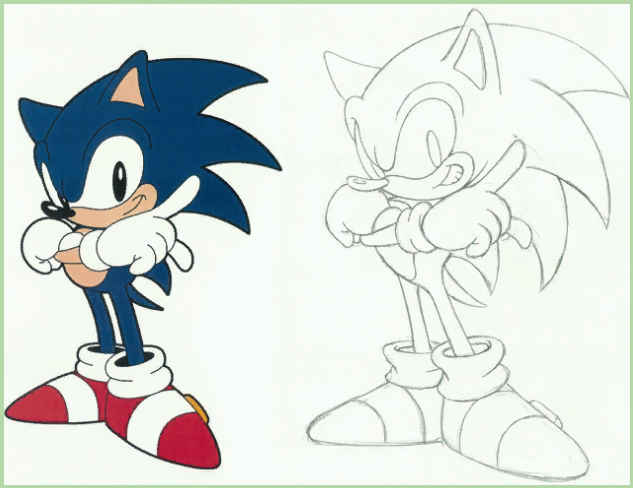
	
Sonic Adventure Concept Art (Late 90s)	Sonic Generations (2011)

However in *Sonic Generations* onwards Modern Sonic completely towers over Classic Sonic, being practically an entire head taller. While this is how the character has been portrayed for a while now and fans are used to this large size variation, if you really think about it doesn't make much sense.

These changes exist for all of the classic cast ***including*** Dr. Eggman. This can be blatantly be seen in the artwork of the two Eggmen from *Sonic X Shadow Generations (2025)*, where the difference in size presented is almost comical in nature with the classic version not even reaching the upper torso of modern.

This is especially strange considering in the original *Sonic Generations* (2011) the two can be seen in much more natural sizes relative to each other in the final cutscene of the game.

This point of going for sizes that looks more correct in relation to other characters segways to the next point of this about "Canon sizes".
If you look at the current website of Sonic Channel, the official japanese website for Sonic The Hedgehog, there are bios for each of the characters, both Modern and Classic. Within these bios heights are given for each character. Using Sonic as an example he is listed at 100 cm or around 3.2ft, but Classic Sonic is then given a height of 75 cm or around 2.4ft.

The issue with these character sizes listed is that they are actually a recent retcon. The current character model sheets used for the "classic" cast shown off around the time of *Sonic Generations* (2011) show Classic Sonic was 100 cm, which is the exact same height as Modern Sonic. It is important to note that Modern Sonic from what is known has always been 100 cm and this height for the character has been on Sonic Channel for many years as seen in the backup site for the older rendition of Sonic Channel.

Screenshot from the old Sonic Channel website.
(https://sonic.sega.jp/SonicChannelOld/chara/sonic/index.html)

This exact same thing was true for Eggman too with Classic Eggman being labeled as 185 cm or around 6ft tall. This is the same size that Modern Eggman is. However when you look at the bio for Classic Eggman you see that he's 140cm / around 4.5ft tall, which is not just small generally but especially small for an adult man, not even mentioning that an adult man should not be growing an extra 45 centimeters randomly.

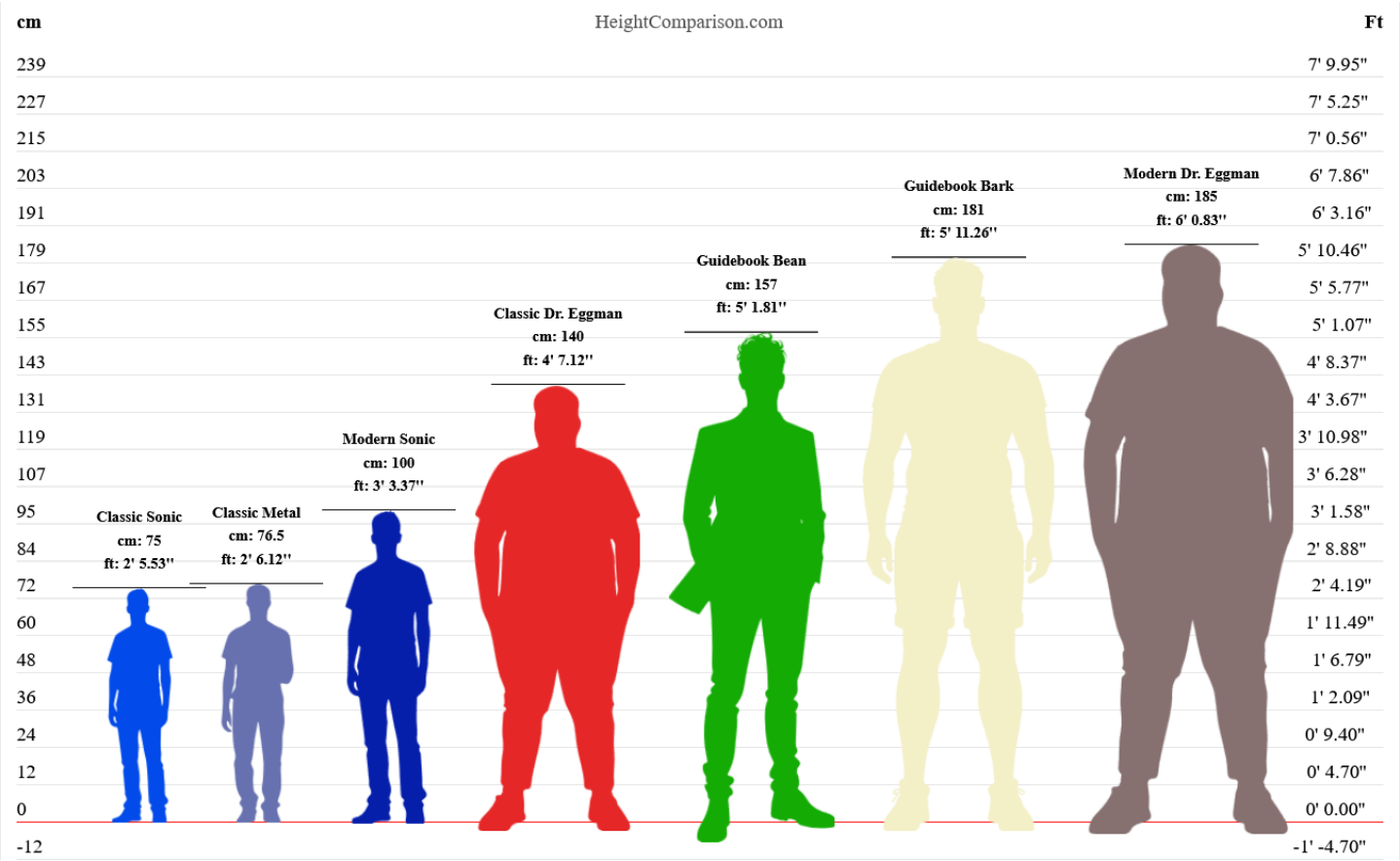
Comparing these heights side by side on a height chart, really showcases why this is a topic worth noting.

The current classic heights might have been taken from a note within the manual of *Sonic CD*, where he is listed as being 76.5cm. This is the height that is currently being used on the Sonic Channel website for Classic Metal Sonic, whereas modern is using the height of 100cm, same as Modern Sonic.

An important distinction to note here is that within the early years of the franchise, official heights were very rarely ever given out and very inconsistent. The most obvious examples being the heights of Bean The Dynamite and Bark The Polarbear from *Sonic The Fighters*. According to an official guidebook for *Fighters Megamix*, a crossover fighting game from SEGA's AM2 division where Bean and Bark were both playable; Bean is ***157cm***, and Bark is ***181cm***.

This would not only make Bean taller than both of the heights given for the two Sonics on Sonic Channel, but it would also make Bark nearly as tall as the current listed height for Modern Dr. Eggman. These can easily be shown to be very silly height metrics just by looking at gameplay from *Sonic The Fighters* seen above.

If you compare all of the official heights given so far you get this silly picture:



The point of bringing all of this up is to say that “official” heights both current and present are constantly in flux and should be used as the standard for presentation within the Classic cast, and rather should be done for what looks natural in comparison to other characters.

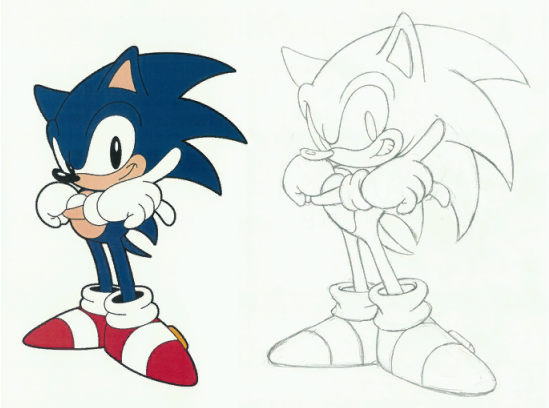
A good example of that is within the *Mario & Sonic at the Olympic Games* franchise. Despite Mario typically being shown of having a height around 5ft 1 inch or around 155 cm. Despite this, Sonic, with his official height of 100cm, is consistently shown to be around the same height as Mario in every game in the franchise.

Mario & Sonic at the Olympic Games Comparisons

Mario & Sonic at the Olympic Games

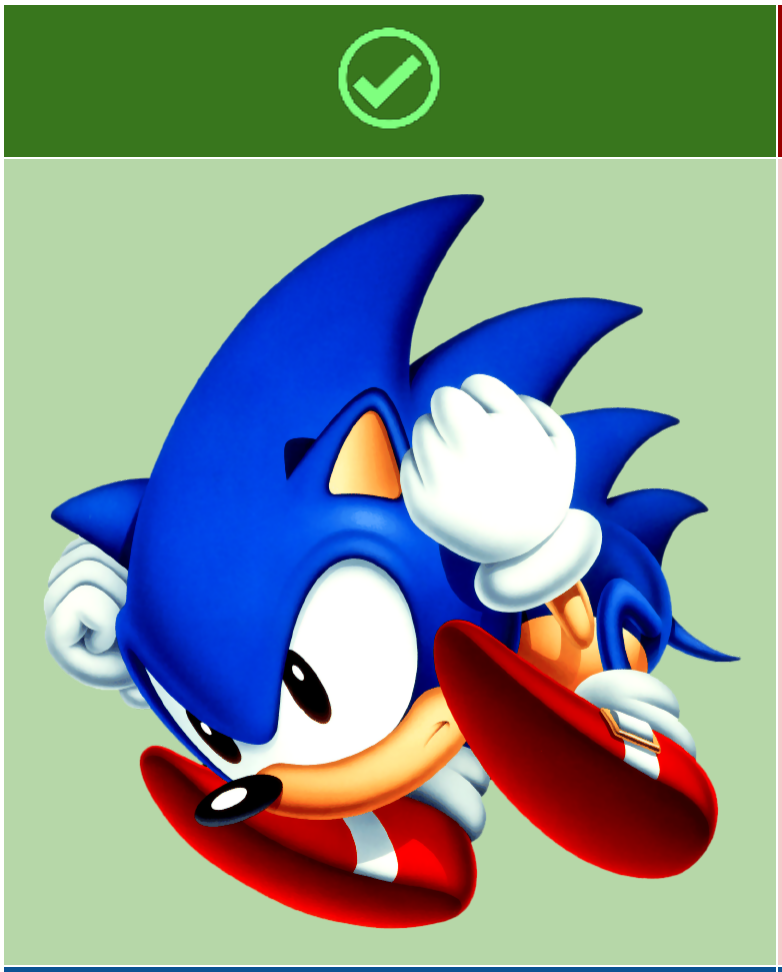
Mario & Sonic at the Sochi 2014 Olympic Winter Games

Mario & Sonic at the Olympic Games Tokyo 2020

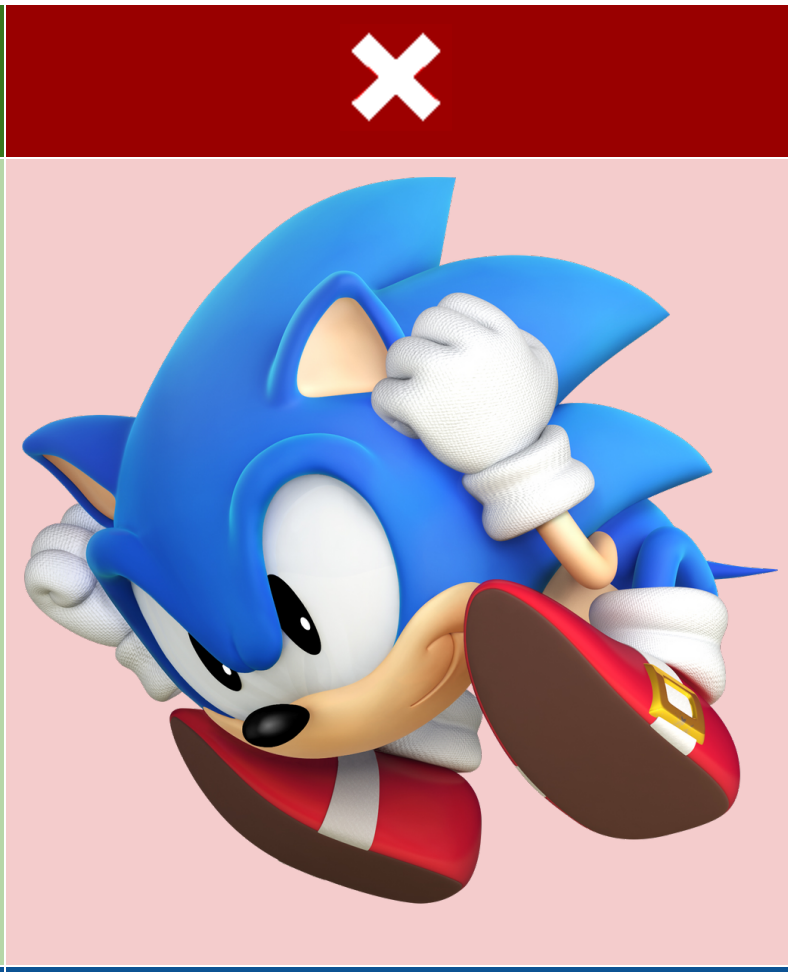


This shows even with “official heights” sizes can still vary to fit the needs of what looks best. This isn’t to say that height guidelines should ever be ignored though. The point being showcased here is to show that the classic characters currently have official much smaller heights and chibi-esque features that take away from their unique personality. Heights have never been 100% accurate and have changed before both within presentation and within statistics. And when it comes to the heights of Modern and Classic Sonic it would make more sense and be more visually appealing to have them more similar in height with only slight differences, rather than the major departure currently depicted in current media.

Besides heights and proportions. There is a second noticeable attribute of “Nu-Classic” that affects the entire cast. That is the colors of the characters. Rather than the striking saturated original colors many of the “Nu-Classic” cast suffers from very light almost pastel like colors. This is most obvious within Sonic who went from having a rich blue to a very light cyan:



Sonic Spinball
(1993)



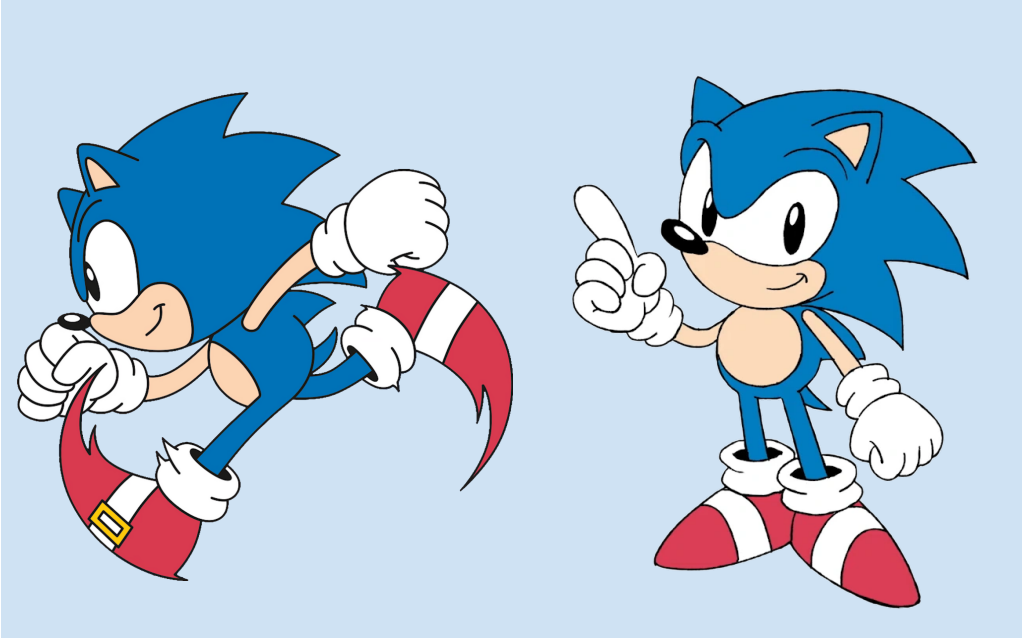
Sonic Generations
(2011)

Outside of generally not being accurate to their original designs, the super light colors mixed with the super small “chibi” proportions can make the characters feel overly kiddy and juvenile. Majorly removing a lot of the “bite” the character and franchise is known for. It is especially noticeable in certain art where “Classic” is paired up with “Modern” in which the character is extremely juvenile and immature looking in comparison to his “Modern” counterpart.

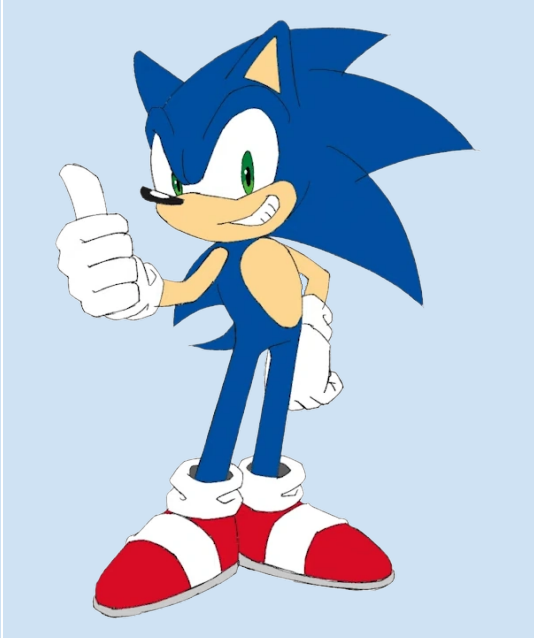
These retroactive color changes can be especially off putting in certain scenarios representing iconic classic locations. For instance in a commemorative art piece made for Sonic 3's Anniversary Sonic can be seen in front of an entrance to a Blue Spheres Special Stage. In this piece Sonic was depicted in his typical "Nu-Classic" cyan right in front of the spheres using the original rich deep saturated shades of blue. However, outside of the comparison of the differing blues, it can be seen that Sonic's iconic Red boots are instead an odd muddy pinkish color making them oddly contrast:

Whilst typically not within any of the 3D models, much of the Classic 2D art (often seen within stock art) has with much pinker hue to his shoes. Though notably his color of blue, whilst still lighter the modern is not as a light cyan as other appearances

If the two sonics from their respective "*Super Sonic Drawing!*" Official videos are put together the differences in colors can clearly be seen with not just the differing color of the fur, but more light pinkish colors for the shoes and oddly even the skin.



Misc. Stock Art (Left)
&
Super Sonic Drawing! #01
(Classic Sonic) (Right)

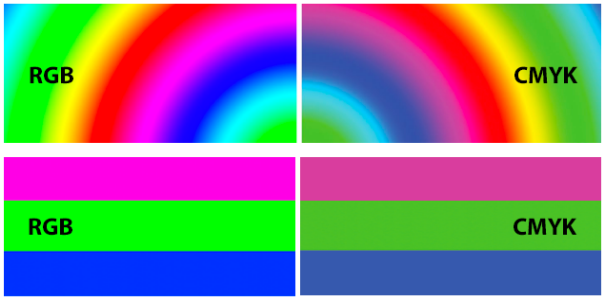


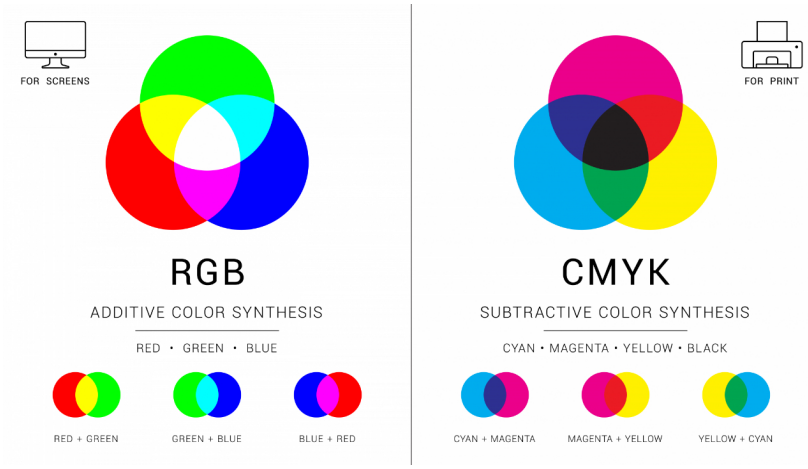
Super Sonic Drawing! #02
(Modern Sonic)

While Sonic has mainly been used as the point of reference for these color oddities the same can be seen within other members of the cast as well. Before this elaborated however:

DISCLAIMER

This upcoming section about the Classic colors, unlike a lot of the rest of the document, has a lot of theoretical assumptions about knowledge on common printing practices and may not be entirely accurate





To begin a brief rundown on CMYK colorspace is needed. What you see on your computer monitor right now is the color space of RGB. RGB as a color space allows the most amount of visible color to be seen as an additive color process, CMYK however is a subtractive process. What this basically means is that CYMK colorspace which is used for printed materials has less colors and shades to work with and converting an image to CYMK can lose saturation and general color information. To help offset this a picture can be made lighter then intended to then have the colors be shifted to CYMK and then printed which can often change colors even further.

This is likely why a lot of the Classic Sonic art has those odd colors. It's because it is then meant to be printed and appear different and color to what the colors should be. An example can be seen below with how the same piece of art when printed on a box for a piece of merch has red shoes and more vivid blue amongst other color changes.

For the purpose of CYMK printing this is normal and fine, the problem that is occurring is that they are using the CMYK colors as reference for how to color the character in a true RGB color space. This can also be seen on the merch on the right where the Sonic Toy was made, an overly bright cyan that does not match the packaging. Or even worse, in games themselves where Dr. Eggman seems to be using CMYK art as a basis for his appearance in Sonic Superstars with his bright pink shirt.

Moving from general cast wide issues to individual cases. A majorly noticeable aspect of “Nu-Classic” is how some characters aren't even fully accurate to the presentation of their original classic designs even with the earlier mentioned proportional changes.

One of the most major examples of this is Tails:

Sonic Chaos
(1993)

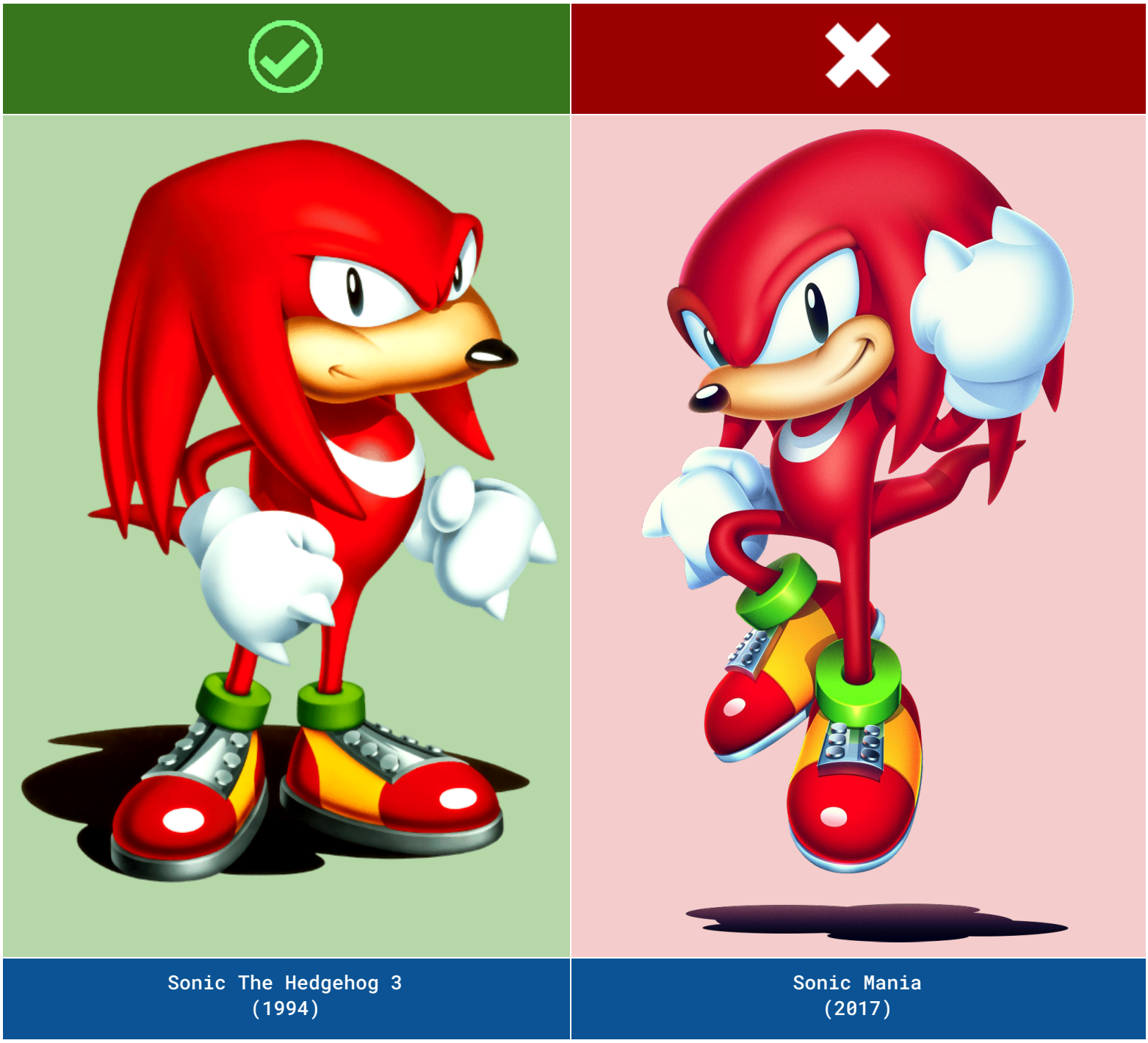
Sonic Generations
(2011)

Besides the already mentioned problems with proportions. “Nu-Classic” Tails has many major differences from his actual classic design. The most notable ones being the extremely small snout and extremely bright fur coloring instead of his iconic saturated orange, even appearing yellow in one render

A Lot of these issues seem to stem from the fact that rather than being accurate to the original Classic Tails design, many attributes here seem to be taken from Modern Tails’ Current appearances with the lighter fur and small snout again being the most apparent. Seemingly the entirety of the current model for Classic Tails is just an edit of the Modern model with noticeable similarities in the way the tails, head and body are modeled. This possibly explains the origins of these issues.

All of these things together make “Nu-Classic” Tails feel more like a chibi-ified version of not just the original design but Modern Tails specifically. Doing this not only gets rid of the unique attributes and appeal that the actual classic design has but makes bringing back the “Classic” designs vs “Modern” designs strange if aspects from the latter are going to be backported.

Another character that has these issues is Knuckles:



Again like tails outside of the recurring proportional issues. “Nu-Classic” Knuckles also has a lot of noticeable differences from his original Classic design. He lost his strong rounded puffed out chest, with it instead being a skinny box-like shape. His entire head shape along with dread positioning is different (connecting at the top of the head rather than the middle to bottom), his face is very different most notably with a very differently structured muzzle and he has very different, and has much more bulbous looking shoes with chunky inorganic metal plating.

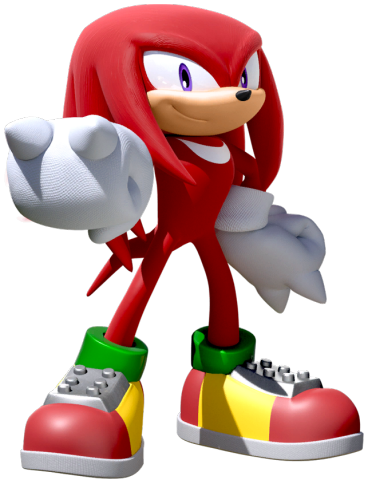
Some aspects and degrees of these problems differ from appearance too, with Sonic Mania giving Knuckles a very tiny muzzle and very tiny metal plating versus art seen on the right for *Sonic The Hedgehog 3*'s 27th Anniversary. Other aspects such as body and shoe shape however are generally consistent within “Nu-Knuckles” art.

Oddly enough Knuckles is the only character to have their originally classic artwork ***completely redrawn*** in stock art. While many characters have the previously mentioned color changes Knuckles is the only character who had his older artwork actively redrawn to fit the Nu-Knuckles standards.

Original 90s Artwork

Current Stock Art

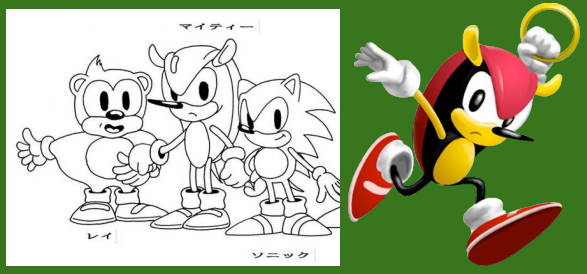
Similarly to Tails, a lot of these issues seem to be back ported from the current look of Modern Knuckles, with the short face, bulbous shoes, skinny body etc. many comparisons can easily be drawn between the two.



Again, this makes “Nu-Classic Knuckles” feel more like a weird small version of Modern Knuckles rather than his true Classic design.

Some of the details present for both Modern Tails and Knuckles that were put back within their “Nu-Classic” looks are actually things that are general misunderstanding of even their general designs to begin with, both Modern and Classic and will be further elaborated on within the next section;

The Last thing to note about the “Nu-Modern” characters is that they are generally standardized to be within the same proportions as Classic Sonic, removing some of their unique character appeal.
This can most evidently be seen within Mighty & Ray:

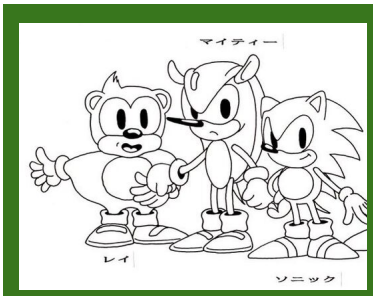


Miscellaneous (Cropped) Line Art (90s) & Knuckles Chaotix (1995)

Sonic Mania (2017)

When Mighty and Ray were brought back in Sonic Mania Plus, their designs were majorly altered to have the exact same proportions as “Nu-Classic” Sonic. However as seen in the concept lineart above of Mighty and Ray, it was decided that they should have differing proportions to help them stand out a bit more Sonic, with the Artwork of Mighty later being reused as Keyart for *Knuckles Chaotix*, with the longer less perfectly round body intact (albeit slightly less long). While In their original apparences in the arcade *SegaSonic The Hedgehog* had them with more matching proportions a push was clearly being made after to give them more unique shaping as besides Mighty’s appearance in *Chaotix* which the “Nu-Classic” versions are clearly not using being standardized with Sonic.

This is especially noticeable in their appearances in the open beta in Sonic Blitz with extremely awkward looking proportions among other issues (most notably, Ray is missing his darker skin tone)



Miscellaneous (Cropped) Line Art (90s) & SegaSonic The Hedgehog (1993)

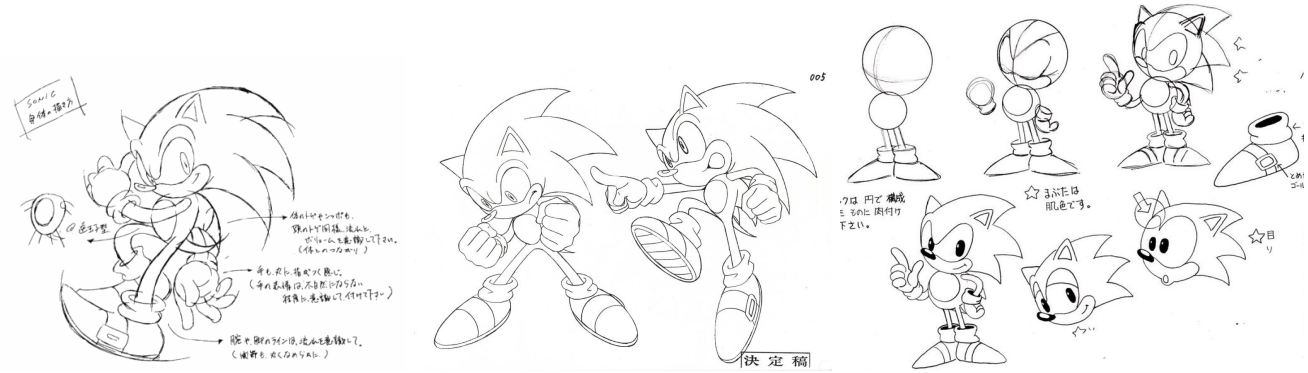
Sonic Blitz (Open Beta) (2025+)

When the entire cast of *Sonic Mania Plus* is all put together it makes it very obvious how much all the characters, not just Mighty and Ray, but Tails and Knuckles too have been majorly adjusted to be consistent within proportions and presentation with Sonic then letting their unique characteristic shine.

3.3 - Character-Specific Study

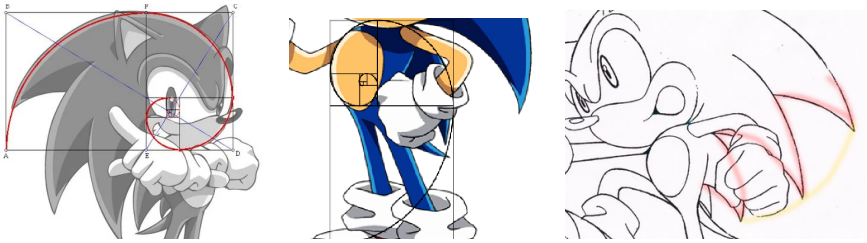
We will now be shifting focus over to character-specific details, starting off with Sonic.

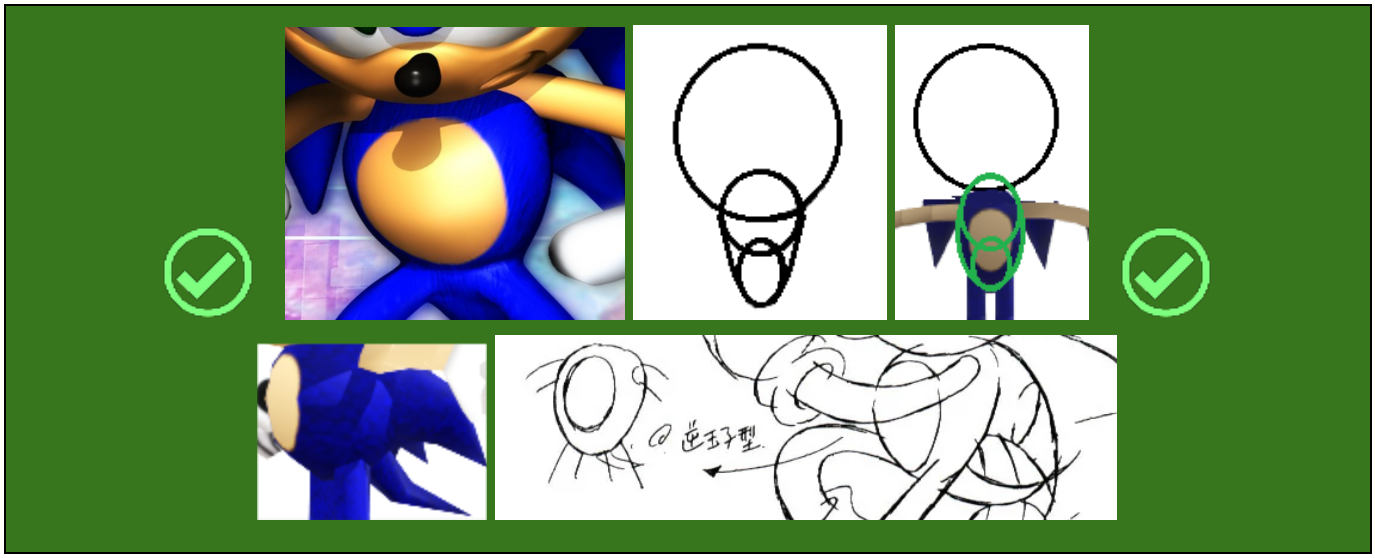
As you might notice Sonic is mainly made of a bunch of spheres, tubes and cones, even his ears and feet are basically cones sliced in half. A lot of the stylization of Sonic's boots comes from the fact that they're inspired by famous pop culture character Santa Claus.



Sonic's torso is also an important part of his character. The circle shape helps emphasize poses and character attitude. However, in recent interpretations it's been reduced to realistic proportions or just flattened. This ignores stylization that makes Sonic appealing. Sonic largely utilizes the golden ratio as a way to make edges harmonic.

The shapes of characters align with themselves harmoniously, with a sense of even-ness, or shared angles and edges.



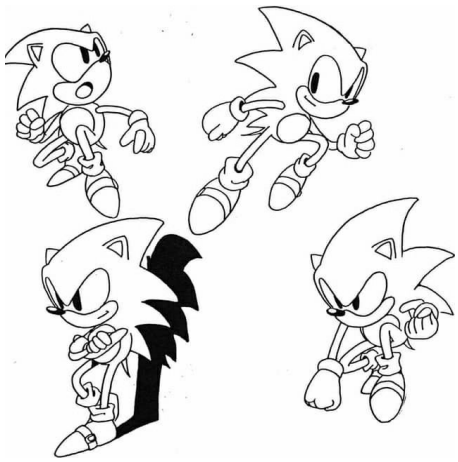


In Sonic Adventure, Sonic's torso resembled intersections between three spheres, creating a shape much like the one of a duck torso. It showcased emotion, agility and proudness. With this in mind we strongly advise against the square shape and flattened shape that started being introduced in Sonic Adventure 2.

Cartoon characters don't have realistic Torsos, Pelvises and have spherical shapes that resemble a ball instead.

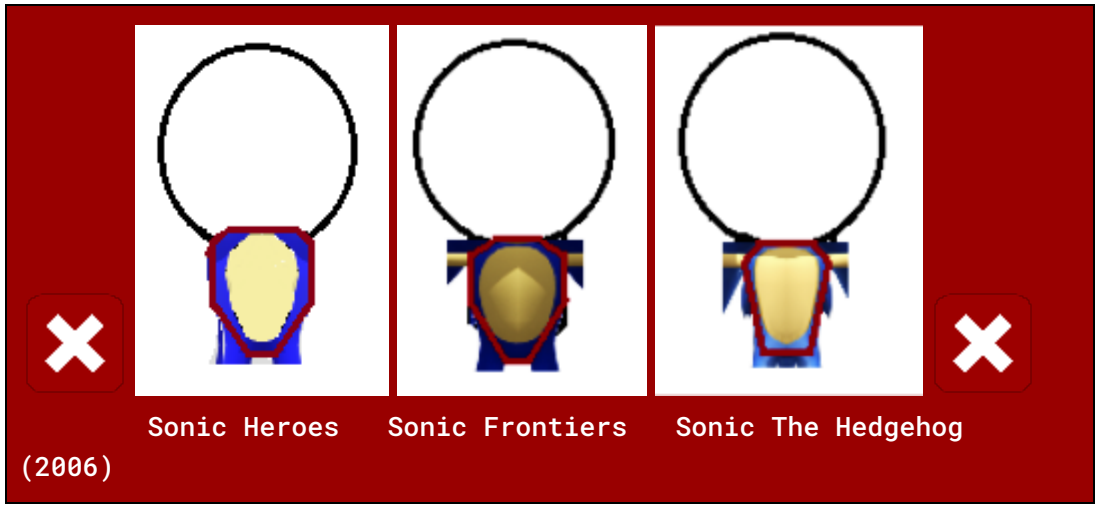
It is a gross misinterpretation of not only basic cartoon drawing techniques to think Sonic has a realistic torso, but also a misinterpretation of the low poly limitations of the past. It results in overall something that resembles Yuji Uekawa and Satoshi Okano's Sonic Adventure artwork but poorly drawn.

Once more it is relevant to bring this point up as from what we were shown in Yasushi Yamaguchi's concept art, Sonic CD and even the art of Satoshi Okano himself, the ball shaped torso that evoques a wrecking ball and the sun doesn't get in the way of



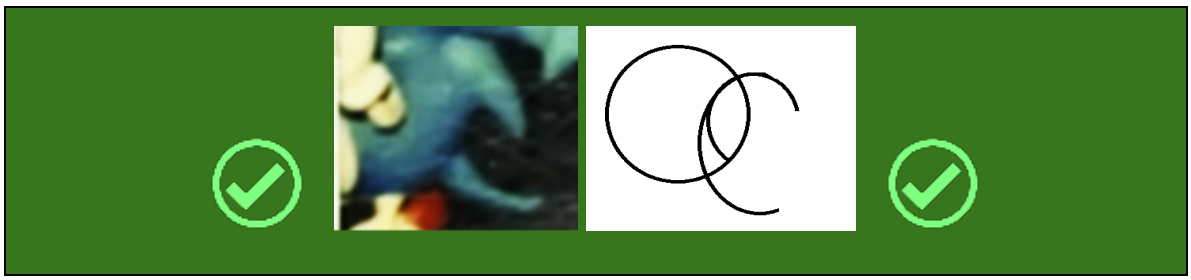
dynamic action at all. If anything, being careful about proportions and understanding the cartooning and reasoning is key to making a good Sonic.

Sonic could have a more ball shaped torso again, and not much would change. Since Sonic is meant to look somewhat cute and approachable while having a lot of attitude that demonstrates his feelings, his rounder tummy also is a sign of approachability to any viewer, as spheres are seen as non dangerous for not having rough edges, which clashes with Sonic's spines



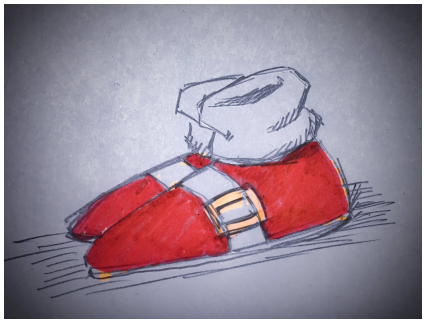
The flatter shape with a very harsh angle on the back also distorts so much the imagery of the circle that at that rate, Sonic is barely recognizable as his older identity, despite marketing and branding reasons in comparison to the proud display of agility and motion, which is especially odd since both "modern" and "old" are the same character. Despite that, their character acting cannot physically act the same, as the torso is part of what helps Sonic curl into a ball.

Moving on, the curved tail that is a bit longer looked great because it complimented the shape of his quills and ears even better than a shorter tail. It gives the feeling of wind flowing and distinct separation of Sonic's quills further. The shape was merely circles connecting to each other.



The absence of this feature makes the quills look less animalesque and more abstract to a point of not resembling anything, and is also bad for the overall silhouette of the character despite it varying according to artist and artwork. Sonic’s own tail and back quill used to look like an arch, but now resembles crab claws instead. This isn’t desirable as it contributes to the issue of the roundness of Sonic not being present.

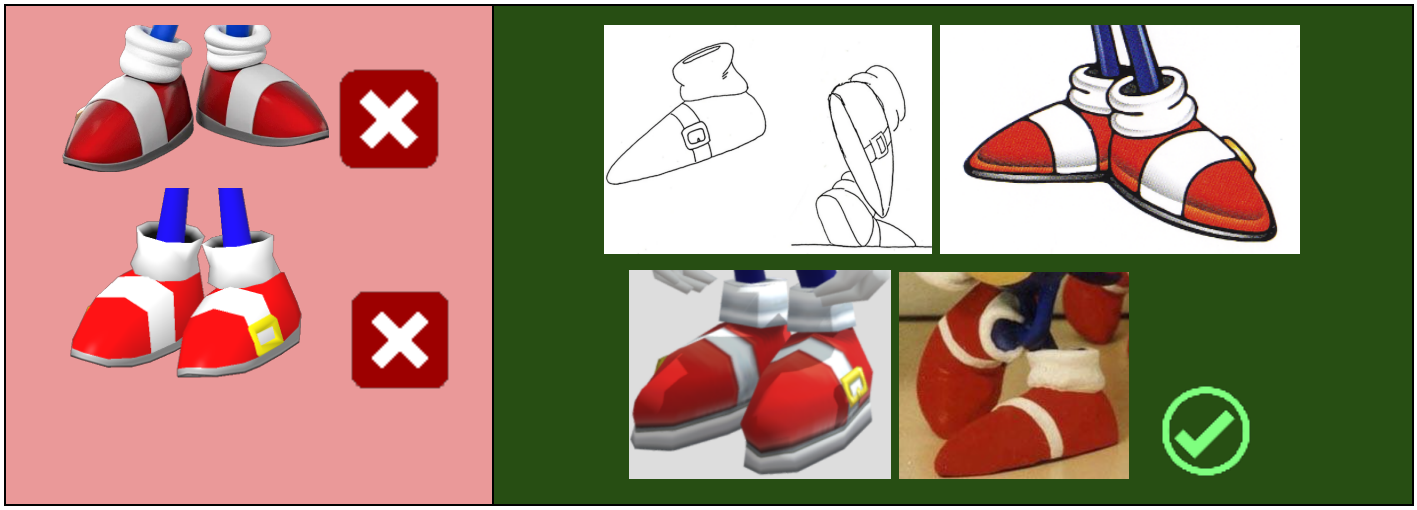
Next up, Sonic's boots. Sonic’s boots have been heavily butchered over the years, they're supposed to have a sleek triangle shape to them. They were also originally based on Micheal Jackson's Bad boots and the colors of Santa Claus.

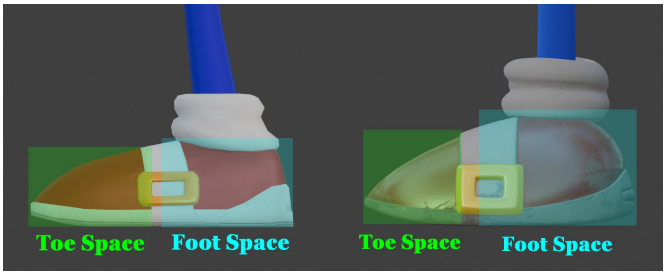


However, now they look oddly round for some reason. They're pretty bloated which causes for a confusing foot shape, it doesn't look very natural or like an actual boot.
The boots don't look flexible enough to bend when necessary, they look stiff and unnecessarily big. Part of the fun of the character is the simple shapes when drawing, and making what was essentially just a triangle into something resembling a balloon or an overly realistic big shape is counter intuitive and diminishes the silhouette.

Sonic characters should always be always animated and expressive, even when drawn still. His body expressions and facial expressions show swing, balance, movement and motion

Sonic's feet being flatter and more triangular also are much like the feet of a real hedgehog and the stylized triangles shape inspired by the short "Mickey's Parrot", meaning any and all clothes the character wears has to be considered for this triangle shape in particular in order for the purpose of doing a good Sonic to be achieved.





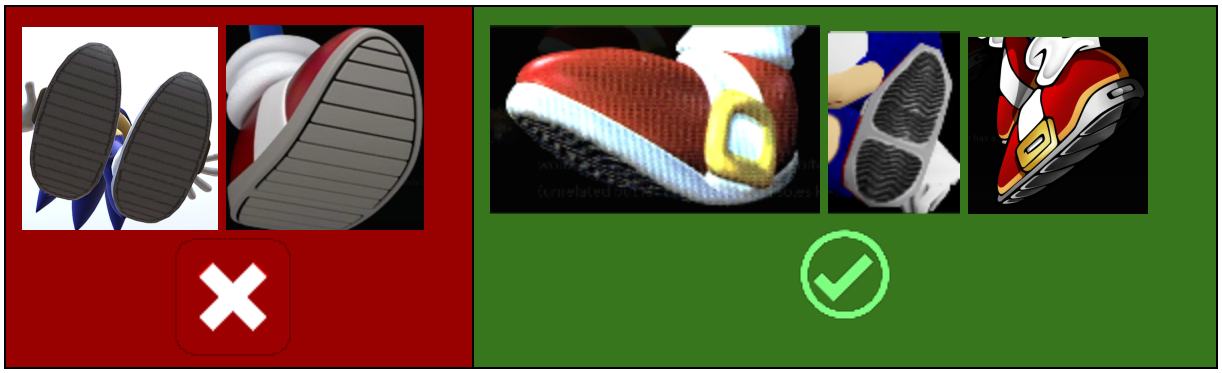
His boot buckle strap has also been pretty misunderstood over the years, to a point where nowadays it looks like it melted into the boot. A thick square not only distracts from the overall purpose of looking like a boot, but also from the overall running animations.

The newer designs for Sonic also don't treat the buckle as an actual life-like buckle with a strap. The problem isn't the fact that it's big, but more so how the purpose of the buckle being strapped on is barely being visible nowadays.
SONIC's boots should resemble their initial inspirations at least somewhat, to a degree of believability.
Something else important to note about the boot is how the cuffs are often misinterpreted as socks when that isn't the case at all. Sonic's cuffs are like real snow boot cuffs.

Good design for purpose is design that projects its symbolic idea to the audience, and not doing so is bad design.

Lastly on boot criticism, the sole of the boots are often portrayed as big simplistic grey soles, and this causes prejudice on the contrast when it comes to the vibrant coloring of the characters. The soles are often interpreted to be made of something like overly beige steel, but it's clearly just a normal part of the boot that's closer to a darker grey in tone with defined black stripes on the sole. There is nothing wrong with the normal red or orange-ish boot soles.

Characters and environments use bright colors, and highlights & shadows are rendered with exaggerated contrast.

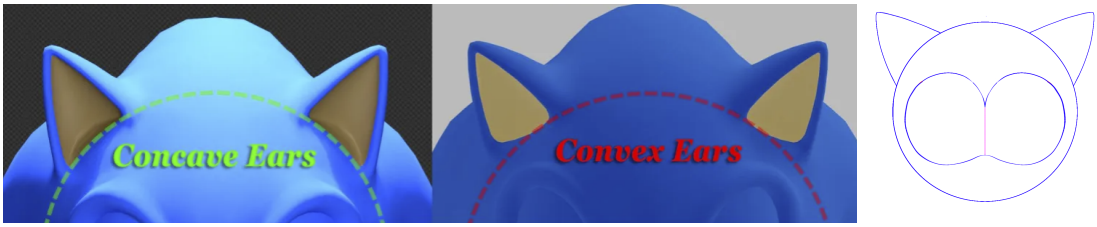


The current soles are very clearly a literal interpretation of the artwork present in Sonic Adventure, which were stylized and simplified for 2D art.

Sonic's ears have also gone through a massive misunderstanding over the years. Due to low poly limitations, the shape has been reduced to what is basically a thin triangle, but that is not how the ear works in the artworks. Usually, the position and length of the ears depends on mood, and they are more soft and cone-like when Sonic is calm, only changing when Sonic is excited.

Sonic characters should look cute when more vulnerable and calm, but aggressive and determined when in action.

The ears of Sonic The Hedgehog operate like a mix between cat ears due to the Felix the Cat inspiration and hedgehog ears.



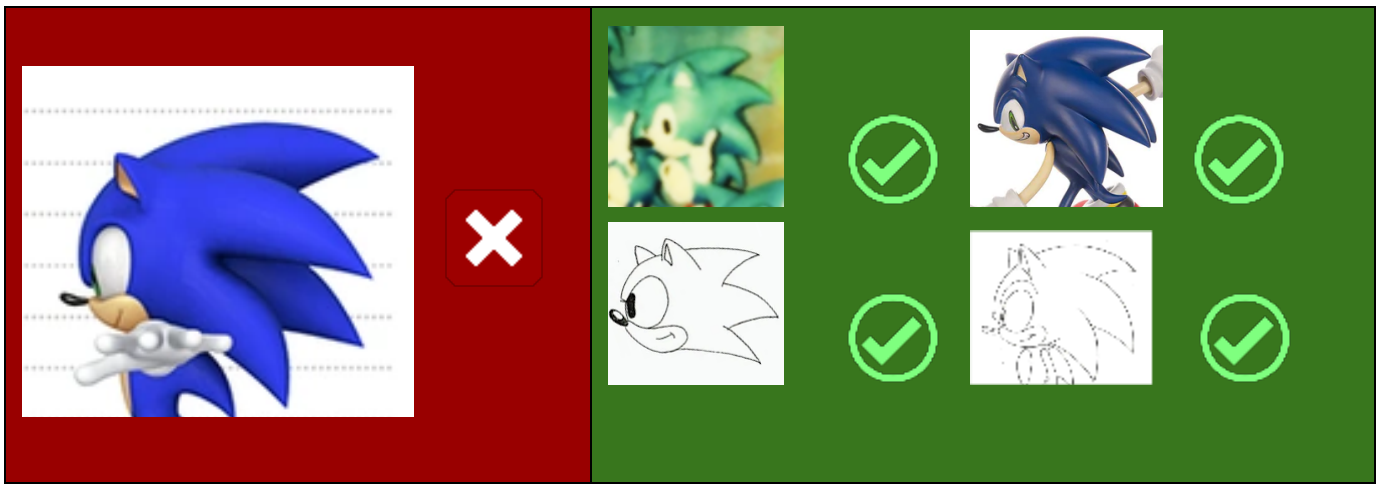
(Section by SockTiger, Sketch By Nero)

The inner part of Sonic's ears has also largely been wrong. The ear canal is supposed to curve alongside the shape of the head through a concave shape. It weakens silhouette and shape language when the ears aren't concave but rather convex.

The characters' heads are spherical, and this is especially true with Sonic. His muzzle, his ears, and his eyes are all built on top of that.

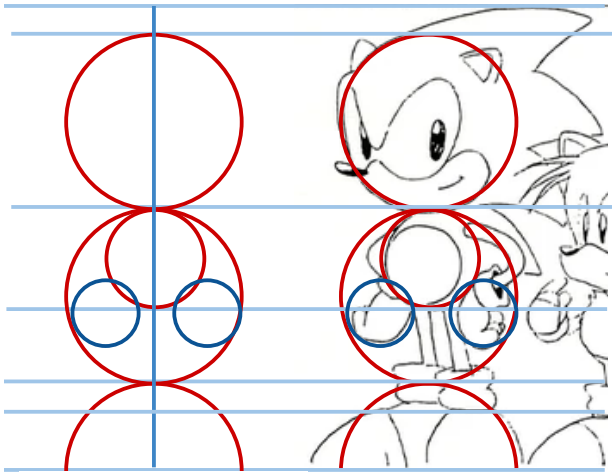
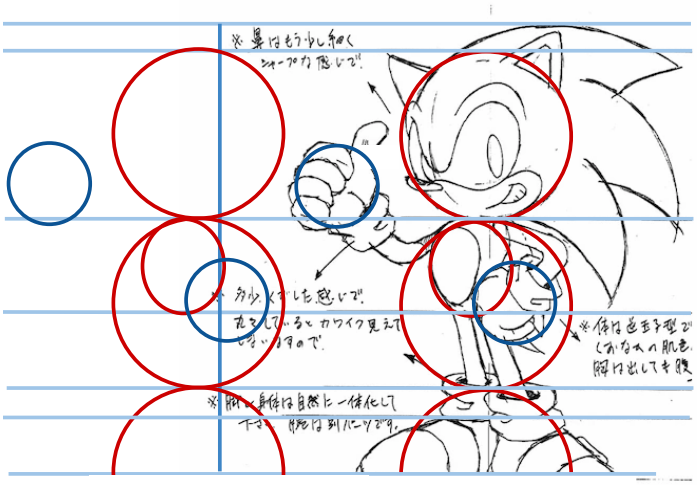
The current game models don't follow that at all, instead his ears are built on top of his quills and his muzzle feels disconnected.

For this same reason, the quills should not be overly long to avoid shape distinction not being easily recognizable. It's not recommended for any kind of animation, including Sonic. The quills also shouldn't be overly thick or overly stuck together. The muzzle should also always curve, creating the appearance of round eyes at the bottom.



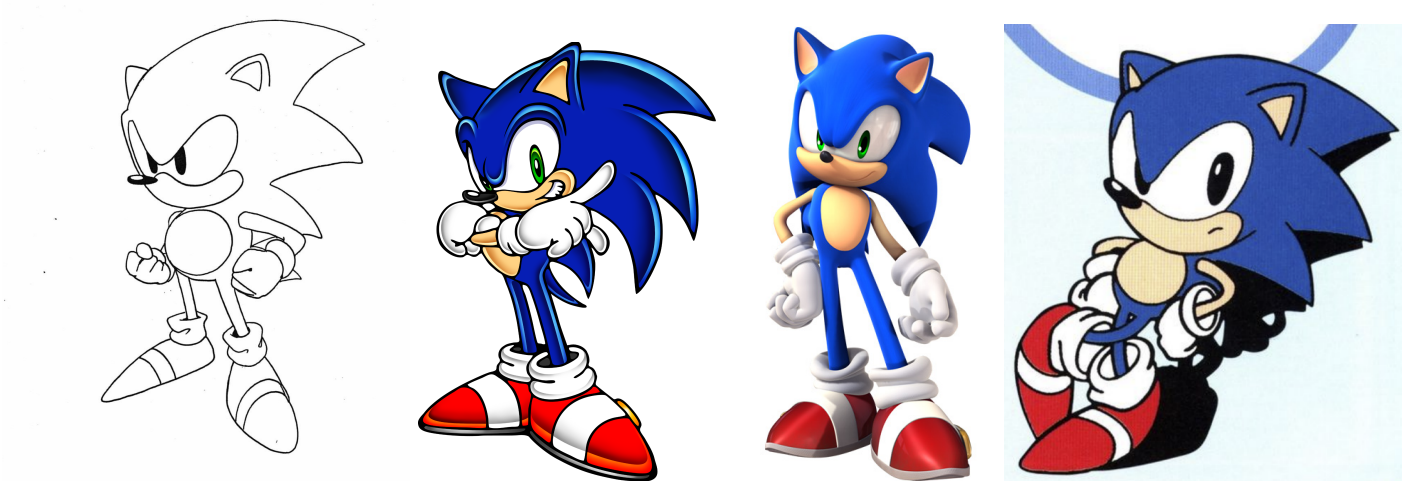
Cartoon characters don't have realistic torsos. The limbs of Sonic characters also don't function like normal human limbs with bone structures, but rather like noodles or rubber hoses

To make it very clear, if any Sonic design fails to meet this criteria proportion wise, it's off the very accurate measurements of proportion in the 2D artwork. Modern Sonic isn't its own more realistic artstyle, but rather a thinner Classic Sonic.

Classic Sonic (Sonic 2 Onwards)	Modern Sonic (Adventure Era)
	
2½ Heads Tall Body ~½ Head Tall	2½ Heads Tall Body ~½ Head Tall

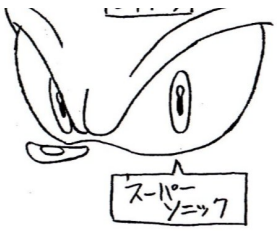
Proportions similar to what eventually was used in Sonic Adventure artwork can be found as early as Sonic 2. The main difference between Yamaguchi's Sonic and the Sonic

Adventure design, is merely a few stylistic changes that clearly weren't a complete redo, but rather a reinterpretation. Arguably, what we currently know as "Modern Sonic" began during the development of Sonic The Hedgehog 2. As such, not following the "Inspirations" section for any and all versions of Sonic is also a mistake.



Super Sonic inherits most problems from normal Sonic, but he has a few unique issues. Currently, the eyes on his model are the same as Sonic's eyes, except he looks mildly displeased. He doesn't even really look angry or focused, just uncomfortable. Super Sonic had a unique eye shape established in Sonic Adventure and Sonic X that quickly disappeared, which may be worth considering as a replacement. It's merely Sonic's eyebrows being thicker and more pronounced, to give off the impression of Sonic turning more aggressive.

"The animated character should be as expressive for animation as an actor's job in live action . Both should be masters of portraying emotions." - Preston Blair: Advanced Animation

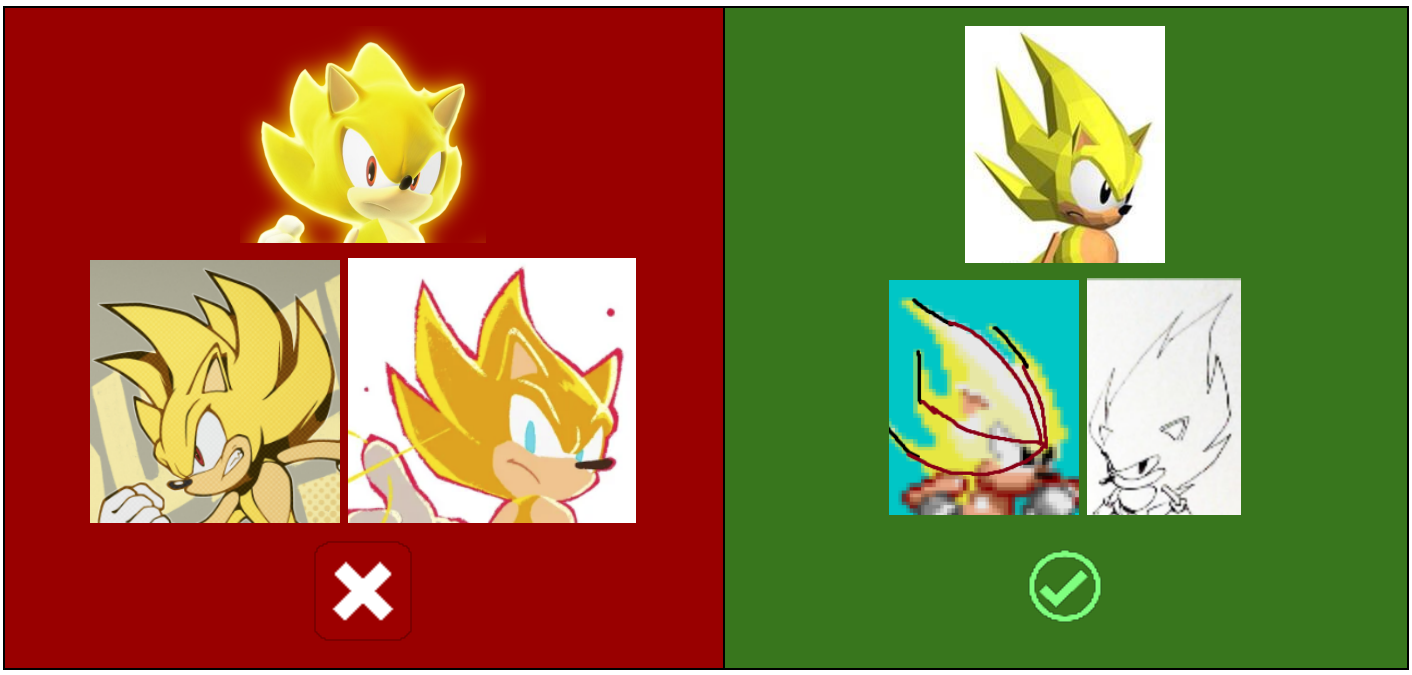
(1999) 

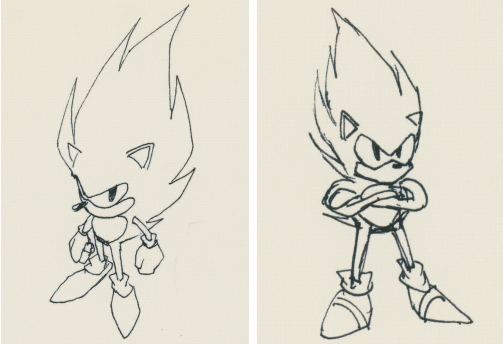
(2022)

Super Sonic's silhouette is also pretty weak currently, he's supposed to feel powerful and strong, but because of Sonic's thickened quills, he doesn't look really aggressive at all.

In Sonic The Hedgehog 2, Sonic The Hedgehog 3 and Sonic The Fighters, Super Sonic's quills will split into several smaller quills to produce a flame-like shape.

This is obviously not really easy to produce as a modification of regular Sonic in 3D. However, it implies a flame motion to the quills that has been lost to time due to misinterpretation.





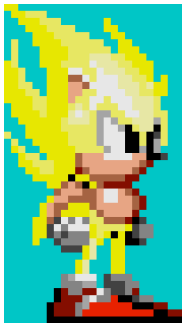
(Sketch by Yasushi Yamaguchi/ Judy Totoya)

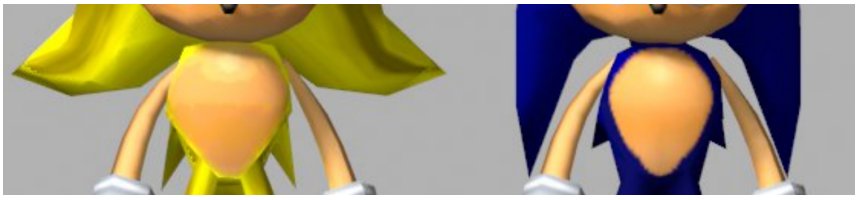
As an aside, Super Smash Bros. Brawl also had a unique trick for Super Sonic's quills; He uses the design from Sonic Heroes, but when he flies forward into the wind, his quills compress into the shape of Super Sonic from Sonic Adventure and Sonic Adventure 2.

Shadow's design was originally intended to resemble Super Sonic, but this resemblance quickly disappeared after Sonic Heroes. This is a clever way to keep that in-tact.

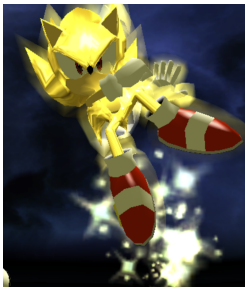
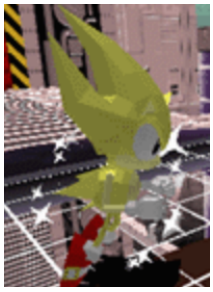
Sonic 3 and Sonic Adventure have a small detail about Super Sonic that is never used again, where his ears actually grow longer.

Super Sonic also had a wider, more puffed out chest in his Sonic 2 sprites and Sonic Adventure 2 design. (Sonic Adventure 2 also seems to give Super Sonic longer back quills) These unique characteristics of Super Sonic should be brought back for greater effect design wise.

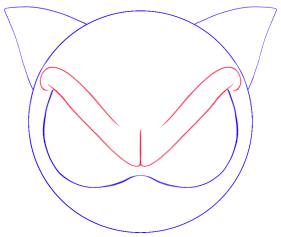




Another greatly forgotten fact about Super Sonic is that the light pulsates between a bright white and a yellow tone. This is often misinterpreted as Super Sonic being yellow or having a Super Saiyan-esque energy trail, when in fact, Super Sonic is unique. Another forgotten aspect are the visible stars that appear and disappear surrounding Super Sonic. A star is always born when Sonic is shining brighter.

Originally, Shadow's eyebrow muscles were much larger than Sonic's, which would make his eye have a very aggressive "U" shape when at rest. This is apparent in Sonic X and Sonic Adventure 2. This is so Shadow can look more grumpy and angry overall. The eyes of "Shadow The Hedgehog" are much like the eyes of Felix The Cat when generally angrier and annoyed.

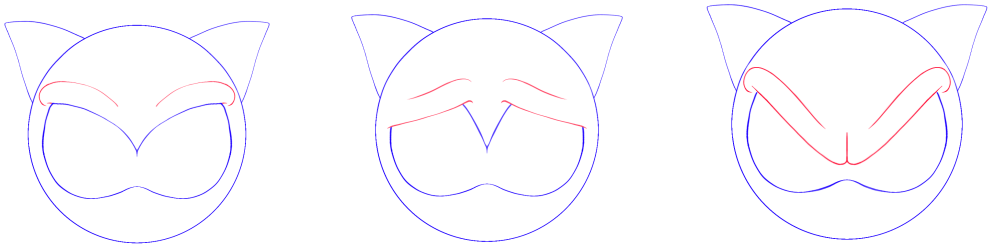


In Sonic Adventure 2, his eyeliner would look angrier when he turned his face toward you, and gentler when he turned away from you. This is because even with large eyebrows, his eyes are still round, like Sonic's. Despite his behavior, Shadow has a gentle heart.

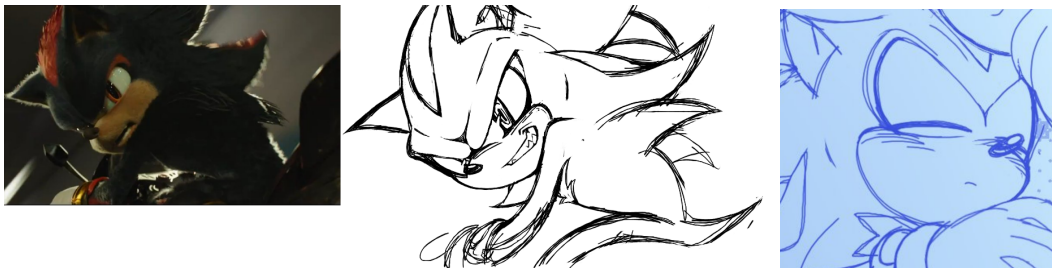
After Sonic Heroes, depictions of Shadow would ignore this and make the literal shape of his eyes and eyeliner sharp and triangular, so he looks angry regardless of any condition.

The eyeliner is also frequently painted and placed very sloppily on the HD 3D models, placed more on the top in an almost in the shape of a rectangle than on the corners in a triangular fashion similar to its kabuki origins.

Shadow naturally has an aggressive resting face. It works better when Shadow’s eye shape is more similar to Super Sonic's when his eyebrows are raised.



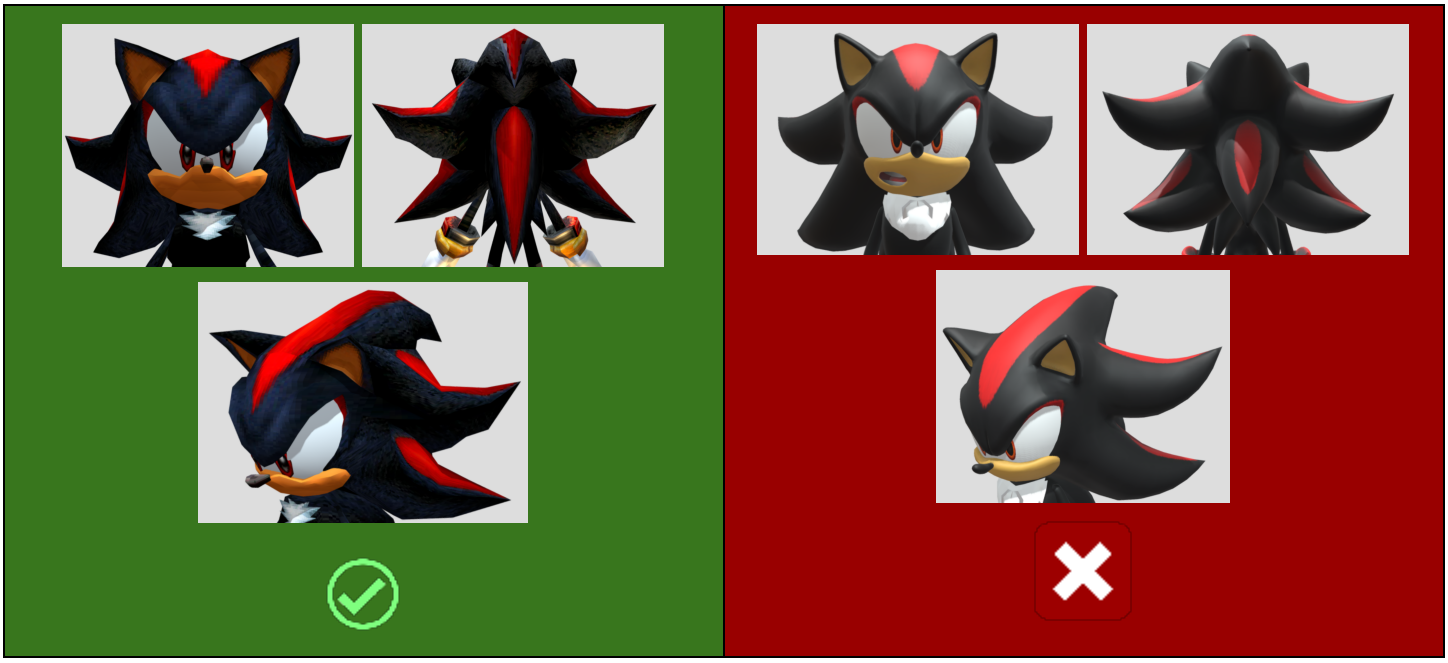
(Sketch by NERO)



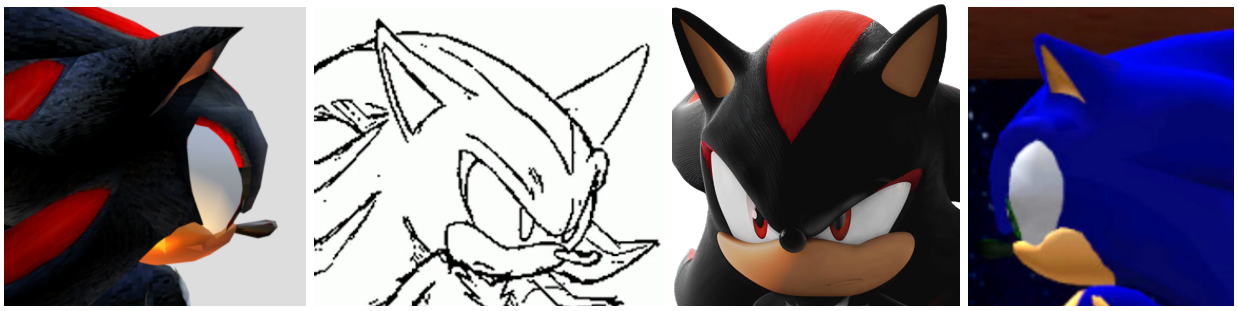
(Sketches by Marcy627)

Shadow’s quills in Sonic Adventure 2 had very interesting silhouettes. They were very thin
and curly, looking threatening and alien. The current design is based on misinterpretation of the 2D art in Sonic Adventure 2.

Shadow's upper quills pointed farther apart than the bottom quills, creating a unique star shape.

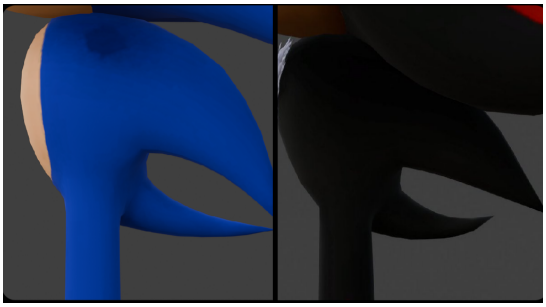


His quills appear to be thicker and straighter now, which makes his silhouette much less intimidating.
In Sonic Adventure 2 and SEGA Superstars ingame, Shadow's ears are long and curve downward, with appearances in 2D art and 2000s 3D appearances having them longer and curved back.



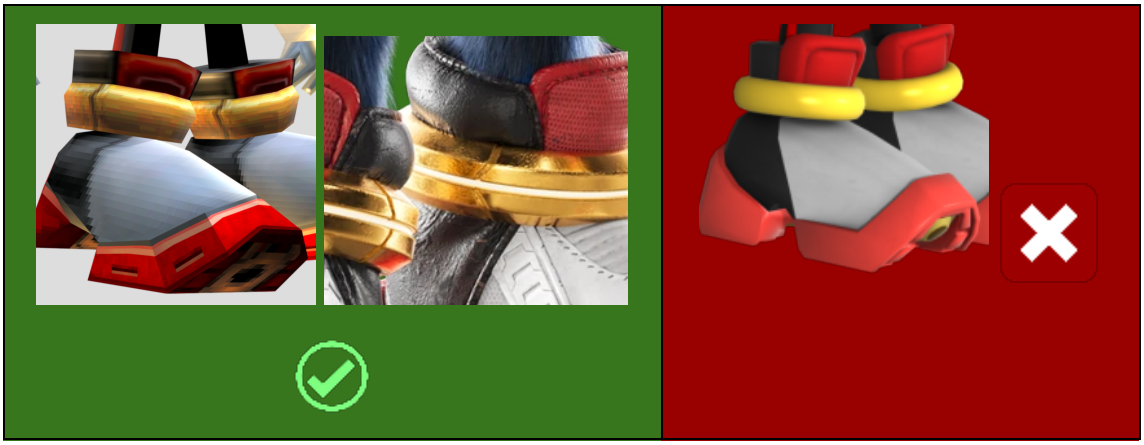
Nowadays however, Shadow is given the same type of ears as Sonic, removing some of his uniqueness

Other examples include in “Mario and Sonic at the 2014 Olympic Games”, Sonic has a curly back quill and a straight tail, but Shadow had a straight back quill with a curly tail.



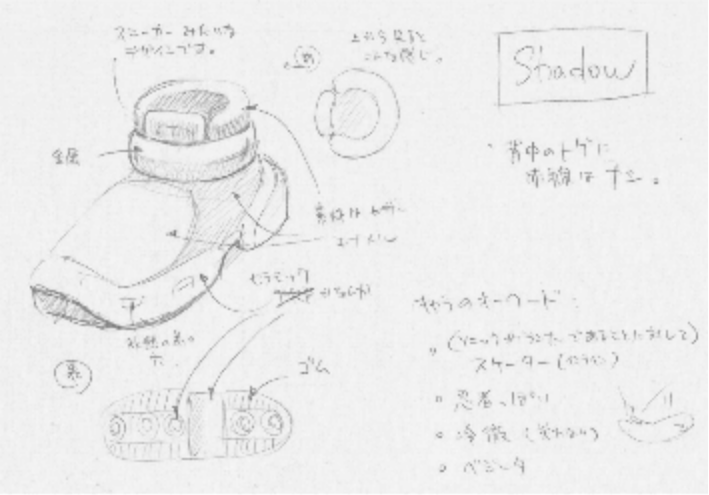
Small details like this are lacking in modern incarnations of the characters, to make it clear that those two aren’t like each other character acting wise.

There's a visible seam in Shadow's limiter rings in Sonic Adventure 2, hinting that Shadow is capable of taking them off. Every other game afterwards removed this detail (although it was brought back for the Third Sonic Movie), which makes the Shadow’s limiters look odd.



This detail along with missing vents on the Shadows shoes makes his shoe design feel incomplete.

- Top Right: Metal Like Sneakers.
- The Material is Leather.
- Bottom: The holes in the shoe are for heat dissipation. What surrounds that heat dissipation area is Ceramic.
- Sole: Rubber.
- Character Keywords: Since Sonic is a runner, Shadow is a Skater (Inline). Ninja-like. Cold hearted: Doesn’t usually smile, like Vegeta.
- Shadow’s back is very spiky.



Shadow as part of his character acting also used to have unique features that were either diminished over time or just poorly adapted. Shadow is meant to run somewhat frantically into somewhat of a struggle to adapt to terrain, in a similar way to Olympic Speed Skating.

> **“走り出しのフォームなんか、スピードスケート男子１００Mのロケットダッシュを結構意識して作っています。 是非遊んでみて下さい”**
> When it comes to my starting form, I actually modeled it quite a bit after the rocket-like start in the men’s 100-meter speed skating event. Please give it a try!
>
> *Kazuyuki Hoshino in an interview*

Similarly Shadow also was supposed to have the ability to disappear in the dark, which is a rather interesting thing that was meant to tie with the plot of Sonic Adventure 2, had it not been as rushed as it was. It gives off a feeling of mystery to Shadow as he is someone who can literally disappear under the lack of light when he wants to.

Lastly, a big part of Shadow’s character acting in Sonic Adventure 2 is done through the character squinting their eyes and often smiling at the player as a form of arrogance towards their opponent while he grins back at them. Celebrating victory as a job well done is a key element in Shadow’s character acting.

TAILS

MILES "TAILS" PROWER

Tails is characteristically made to be thought up as a "younger brother" type character. Someone who follows Sonic as a role model but still can run and fly on his own way.

"Mr. Naka asked me to create a character that looked like the innocent fox from *Urusei Yatsura*, and this is the result.
At first, it had just one tail, but since that didn't make much of an impact, I took inspiration from Miau from Phantasy Star 1 and came up with the idea of giving it two tails that it could use like propellers."

Yasushi Yamaguchi on Twitter

As such, following the instructions of Yuji Naka, Yasushi Yamaguchi created the initial designs for Tails. However, a lot of elements that made the original design appealing have been slowly disappearing over the years and this is relevant to keep in mind to draw an appealing Tails.

Let's start off with the basic shapes that make up Tails' design. First there is a round oval shape with a curvature only in the front of the face. This curvature settles down a bit as the fox muzzle protrudes forward, indicating Tail’s unique species.

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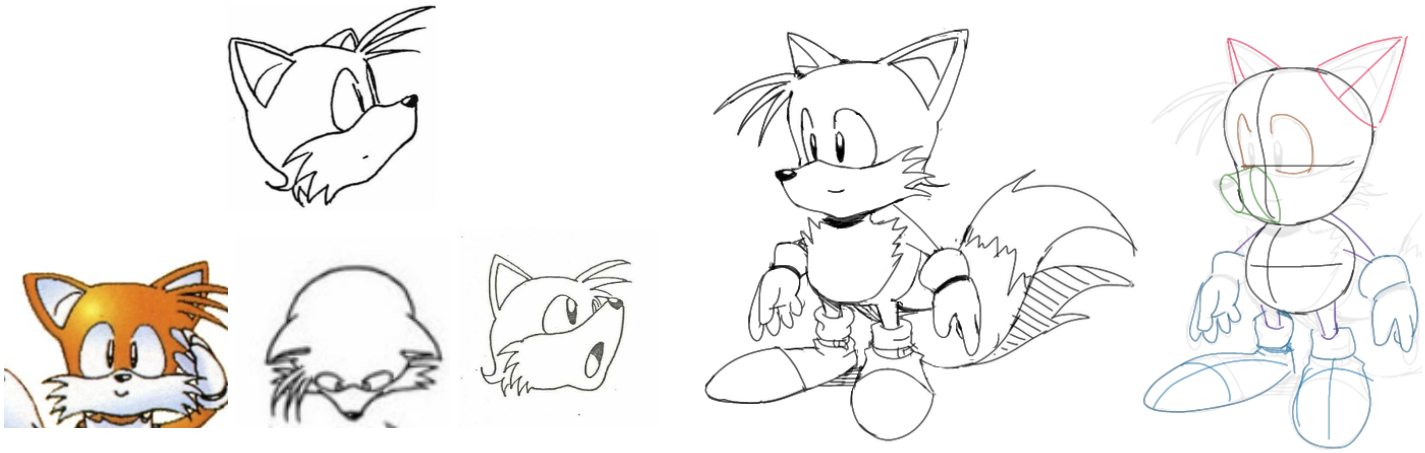
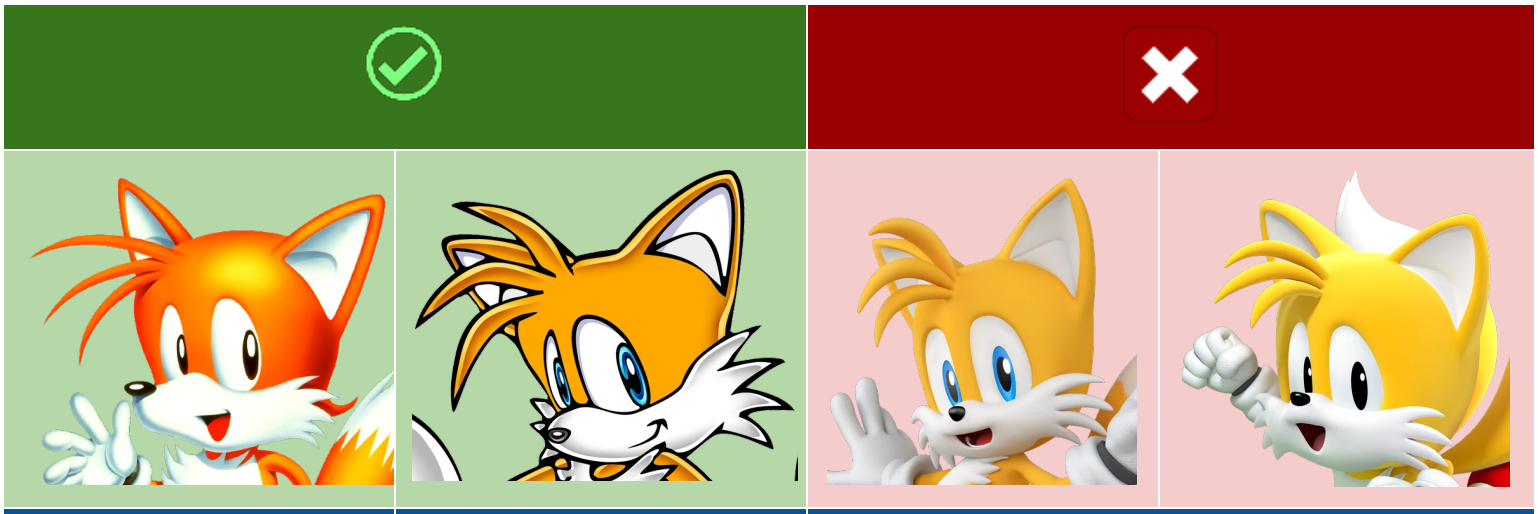
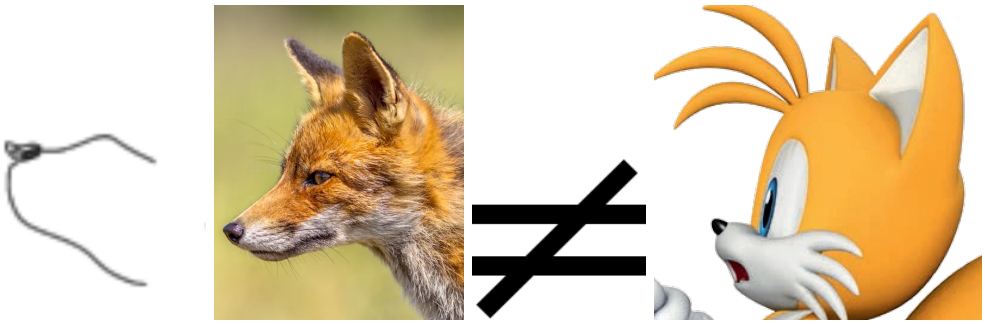


The first and most obvious issue that is typically pointed out with current depictions of the character both for modern and classic is that despite his long snout being a defining part of his design, current depictions have little to no snout. This issue is especially prevalent in 3D appearances, but can be seen in 2D as well.



Sonic The Hedgehog 2 (1992)	Sonic Adventure (1998)	Sonic Generations (2011) (Classic Art Flipped)	

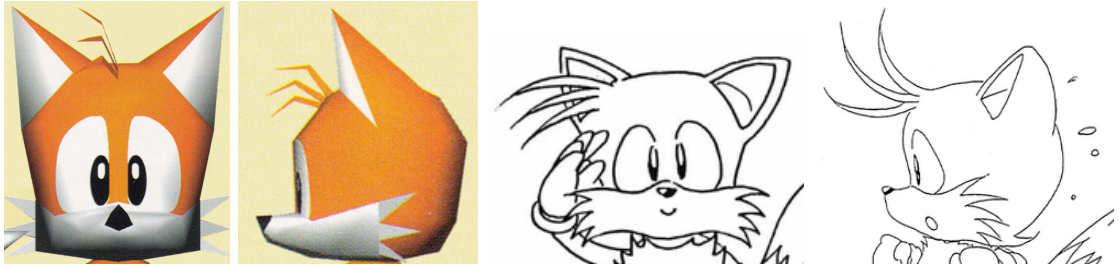
The overly and inward shape Tail's snout took over the years since Sonic Adventure harms the silhouette and uniqueness of the character in comparison to the snout being just a rounder line, as it makes it less readable from afar if Tails is even a Fox at all, which was the main reason for his snout being more characteristically realistic.



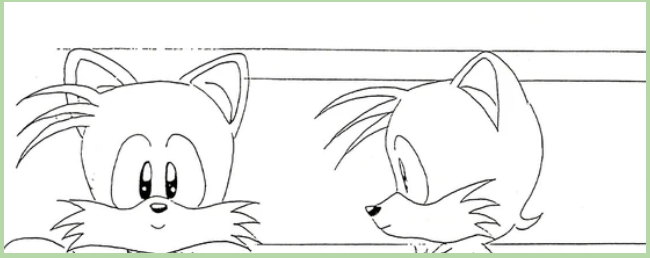
Tails has a small curvature on the front of his face due to the snout taking place there.

Do not misunderstand the snout shape to be across all parts of the head.

This curvature is something that comes from the original artwork by artist Yasushi Yamaguchi, although heavily adapted for the somewhat weak hardware of the time in games like Sonic Jam, Sonic R.



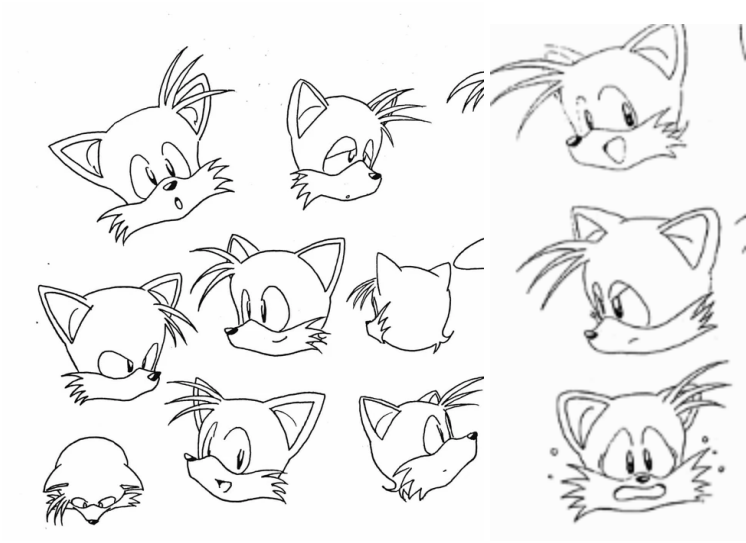
However in more modern interpretations of the character where hardware isn't a restriction anymore, this somewhat seemingly boxy shape seems to have molded itself as a part of the character, with a flat forehead, flat top of the head, and flat back instead of the much more appealing original organic rounder shapes that persists through 2D art of all eras.



Classic Model Sheet
(1990s)

Team Sonic Racing Overdrive Model Sheet
(2019)

Tails eyes always tend to look somewhat drooping, as if giving a look of innocence with a bit of nervousness. This often is described in moe settings as a “Tare-me’ eye and Tails consistently has this throughout the artwork of Yasushi Yamaguchi. The shape itself remains consistent unless it’s to push some kind of extreme expressions. This was kept throughout the 90s and early 2000s as a base for how Tails would facially react to things even through miscellaneous artists.



Whilst originally more present in this Modern design as the years went on this defining eye shape had been deluded sometimes in the 2D art, especially in the case of the 3D models where it is barely present at all and has more of a static boxy shape instead, which looks generally a lot less appealing.

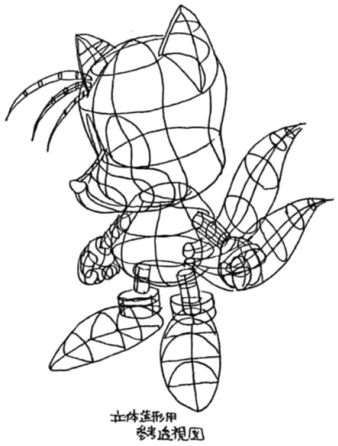
✓	≈	✗
Sonic Adventure (1998)	Sonic Rush Adventure (2007)	3D Stock Art (2010s)

Any little bit of Tail's fur is meant to look fluffy. Tails as a whole from conception is meant to give off the impression of a big furball. However in more modern versions of the character this feature is simply absent. At first this started due to poor rendering capabilities of fur in the early 3D era but as time progressed, it just started looking uncanny and unpleasant, especially in the modern day, with stubby fur clumps on the face, torso and tails being round and lumpy.

Tail's tails have this weird sort of gradient smoothed out shape instead of proper texturing to work around it to give the stylized illusion of more fur, although it is present on Classic Tails.

Tails proportions and features are also largely based on Sonic's, although a bit more stubby in with a wider stomach in comparison. In Sonic Adventure Tail's design worked so well that the only major change received for the character was the addition of the blue eyes. The model utilised for promotional and conceptual CGI material was largely still

based on the same one used in 3D Blast: Flickies Island and Sonic Jam.



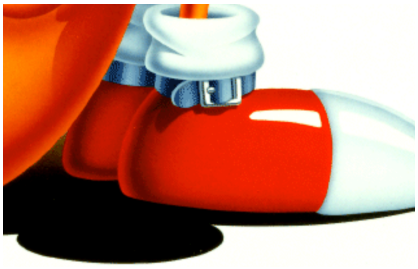
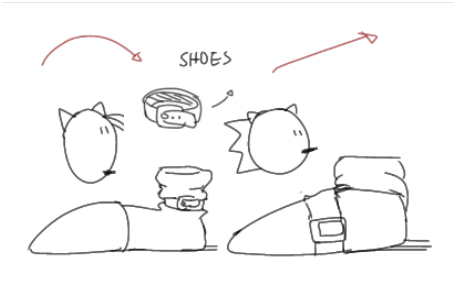
The proportions and fatter shapes and limbs emphasizes the cute factor of the character. Many people think that Tail's small limbs could be a problem to motion overall, but that is just factually incorrect.

Tails is a rubberhose character who can stretch his limbs for whatever motion needed.

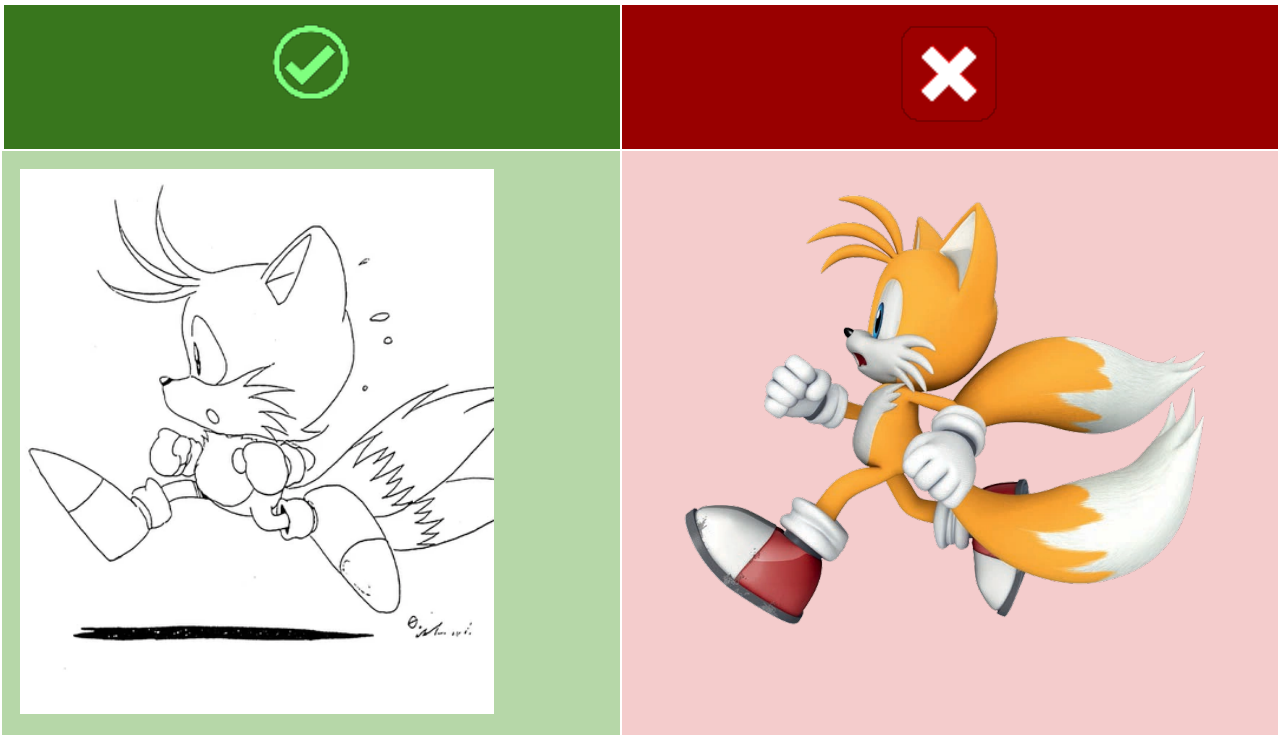
With this being said, it should be noted that there isn't anything inherently wrong with Tails looking somewhat less stubby for the sake of having more clarity in motion, but these characteristics need to be maintained in some capacity to reach appeal. This was widely experimented with during the 90's and 2000's.

Despite Tails's small body, Tails wears improvised big winter boots to look like Sonic. He wears blue belts on his ankles and black belts on his wrists to keep his clothes secure because they're too large.

Be careful to not draw both the shoes and gloves exactly like Sonic, as Tails wears them differently due to his size. Tail's boot is also a lot more curvy in comparison to Sonic, and gloves are looser.

Current depictions of Tails make the belts really thin, which makes them disappear underneath the cloth wrinkles often. The metal buckle has also been removed, which makes it much less obvious that it is a belt.
Be careful when drawing Tails to not overly make Tails have Sonic features. This has been the main flaw of recent interpretations of Tails (especially in 3D appearances). Tails has fatter and smaller limbs, a smaller body and clown-esque snow boots. Tails might seem straightforward when drawing but in reality he's a lot more unique than a lot of people give credit to.

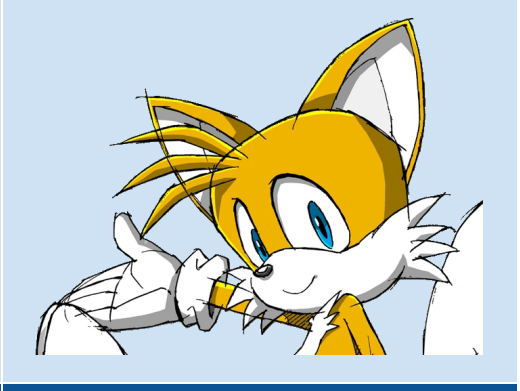


Tails's hair-bangs would often vary in angle and length in old 2D art. On most occasions, his hair was straight, very thin, and pointed downward. It resembles the kind of lazy comb-over hairstyle that a kid would wear every day, trying to be as neat as possible with minimal effort and no hair gel. It's befitting of the younger brother character.

Try keeping the hair less tall as well as more straight and thin:

Sonic The Hedgehog 2
(1992)

Sonic Channel
(2011)



Sonic Channel
(2012)

Rather than tall, spread out and thick:

Modern 3D Stock art

Modern 2D Stock Art

The current features generally portray a different personality compared to the old one seen in Classic and a good amount of Modern's 2D art. It doesn't resemble more confidence, but rather unneeded simplifications. A lot of these changes were made in order to make Tails work within the more curved art style of Sonic Adventure in 1998.

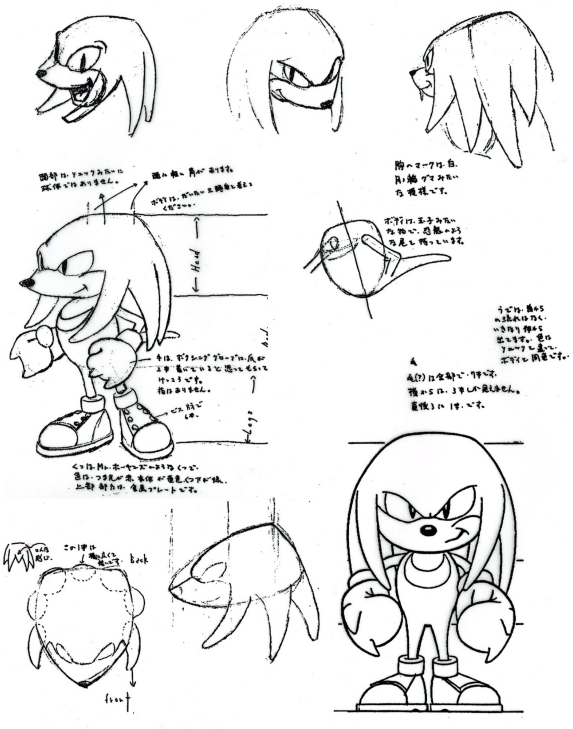
However, a lot of these changes got misinterpreted or intentionally kept as definitive changes, to a point of affecting the character's unique visual personality.

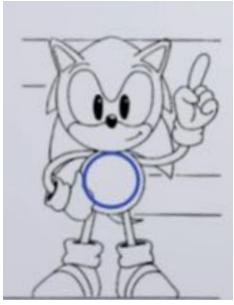
The portrayal most definitely got weaker by taking away Tail's overall cuteness, which was derived from anime and manga characters of the 80's and 90's. There's a misconception that these changes are supposed to represent increased maturity but that's not true. The changes in Sonic Adventure were relatively minimal to Yamaguchi's design, and the few changes that were made in games like Sonic Adventure, largely tried to keep the same appealing characteristics to the character.

KNUCKLES
THE ECHIDNA

Knuckles is a very interesting design, because his anatomy appears to not be based on any pre-existing animal, real or cartoon. So, we will have to explain a bit more than usual. A lot of the aspects that make Knuckles interesting and recognizable were reduced for various reasons, although, despite creative intent being somewhat towards this being an artistic decision, we consider it generally worse and undesirable due to the silhouette and shape language communicating less of a personality compared to the original design seen both in the Classic, Dreamcast Modern Era, and occasionally Sonic Channel art.

The echidna is a bigger animal than the hedgehog, with a large snout, large claws, and large quills. Similarly, Knuckles is taller than Sonic and possesses more skills to take advantage of his environment. As such, the character design also reflects this. Knuckles, much like any other Sonic character, have the characteristics of multiple different animals.

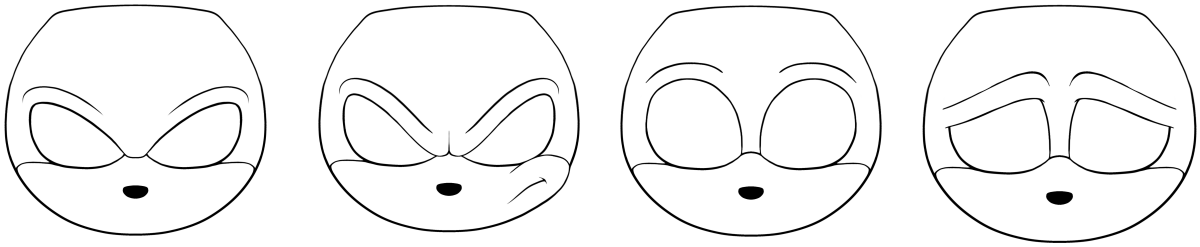




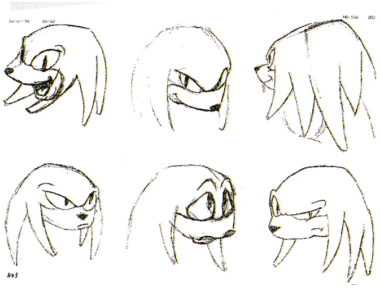
The shape of Knuckles's skull is deceptively simple, appearing complex without an explanation. It's a sideways teardrop, which looks more animalistic than just a ball.

The roots of his dreadlock-esque spikes have square-ish edges, making his head appear sturdy and flat, like a helmet. Knuckles overall has smaller eyes that are farther apart, clearly separated in the middle by his forehead.

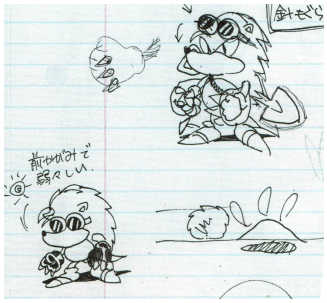
Knuckles has eyes that don't bulge out unlike Sonic. However, the brows work similarly to Sonic despite this difference. The more the brows are apparent, the more exaggerated the expression is. Similarly to Sonic, Knuckles also has a resting angry face.



(Tako Makino's Knuckles Reference Model)
(Left: Horizontally Mirrored)

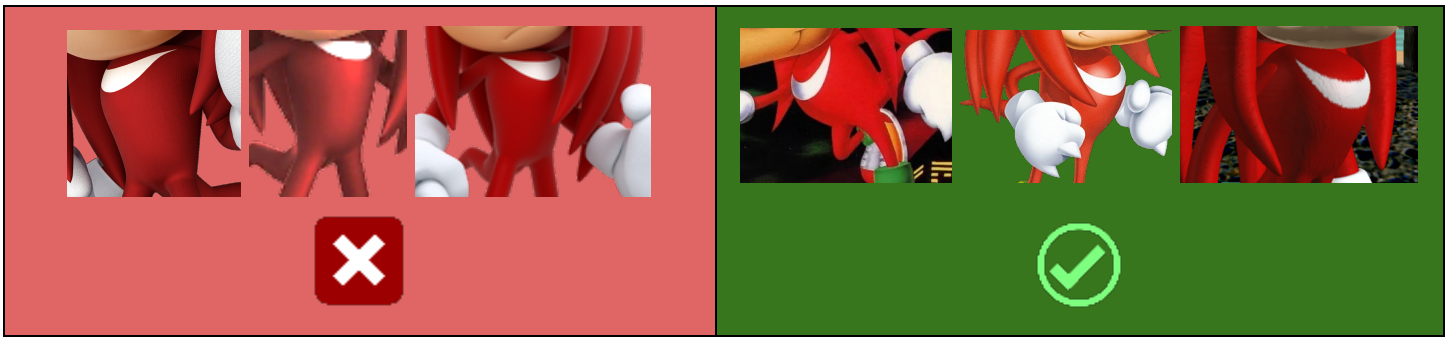


Knuckle's appearance gives off the resemblance of a mole, as even during very early initial concept art, the character was thought of as one who digs into the ground. However, whenever Knuckles is aggressive, he shows teeth and gets very short eyed or wide eyed to exaggerate any given expression. This more aggressive and tender look can be interpreted as close to how a puppy acts.

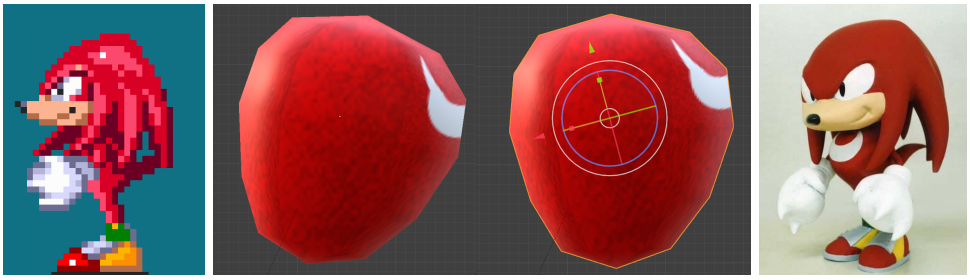


Knuckles's body has a widened top like an upside-down egg, to emphasize the chest and suggest that he is muscular. He bears the mark of the moon bear, to suggest a bear's strength, and to mirror Sonic's circle shaped belly. Whenever Knuckle's chest is reduced, and the round shape of the moon bear mark is not emphasized, it starts becoming unclear

as to what that white strip even is. This was still present in games like Sonic Adventure 1, although the more time went on, the more it faded away.



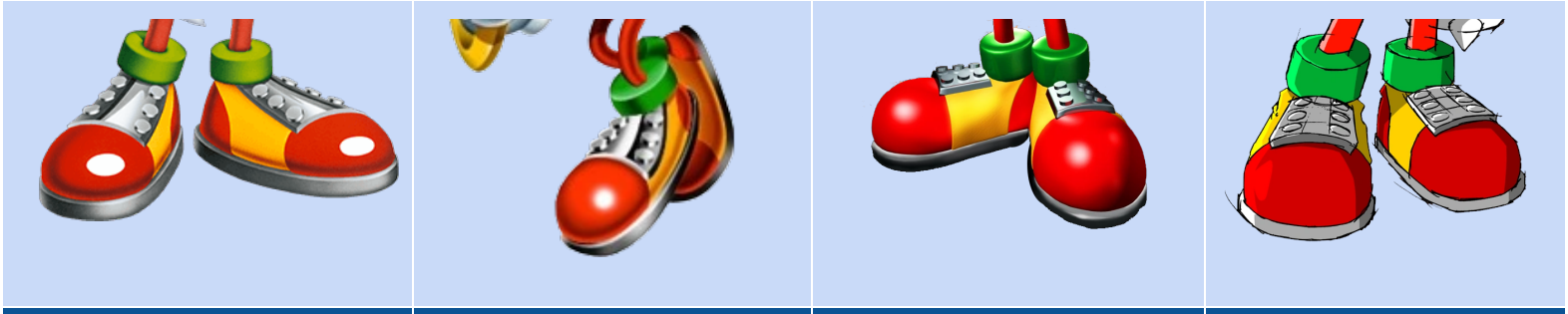
A very overlooked reason for this occurring is that when you try to pose Knuckles regularly, the moon bear crest is often hidden by Knuckle's head. In an attempt to reduce this effect, Knuckle's entire torso was redesigned to reach a more effective result in 3D. However this issue always had a rather simple solution to it, which is a fact not very well known at all for artists.



Knuckles's body leans forward at around a 75 degree angle.

While this is mostly part of the character acting, it is worth noting as an important detail of the design.
Knuckles is clearly shown with a unique flattop somewhat bullet shaped oval torso.

In current depictions of Knuckles, the egg-shaped physique is minimized and unremarkable, and the moon-shaped mark is placed too high up to be recognizable. The tummy also looks too similar to the other characters, making Knuckles look less unique in comparison.

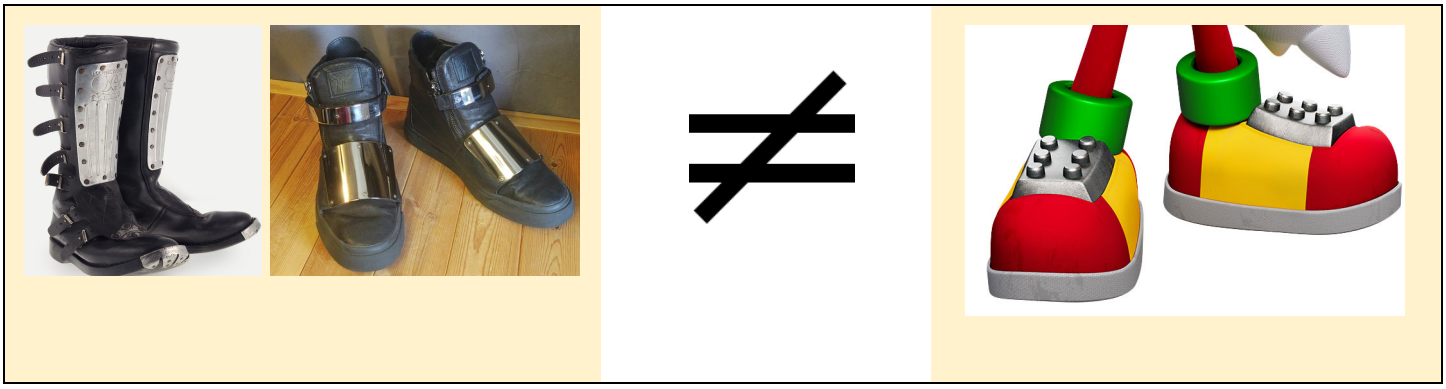


Sonic The Hedgehog 3 (1994)	Knuckles Chaotix (1995)	Sonic Adventure DX: Director's Cut (2003)	Sonic Channel (2012)

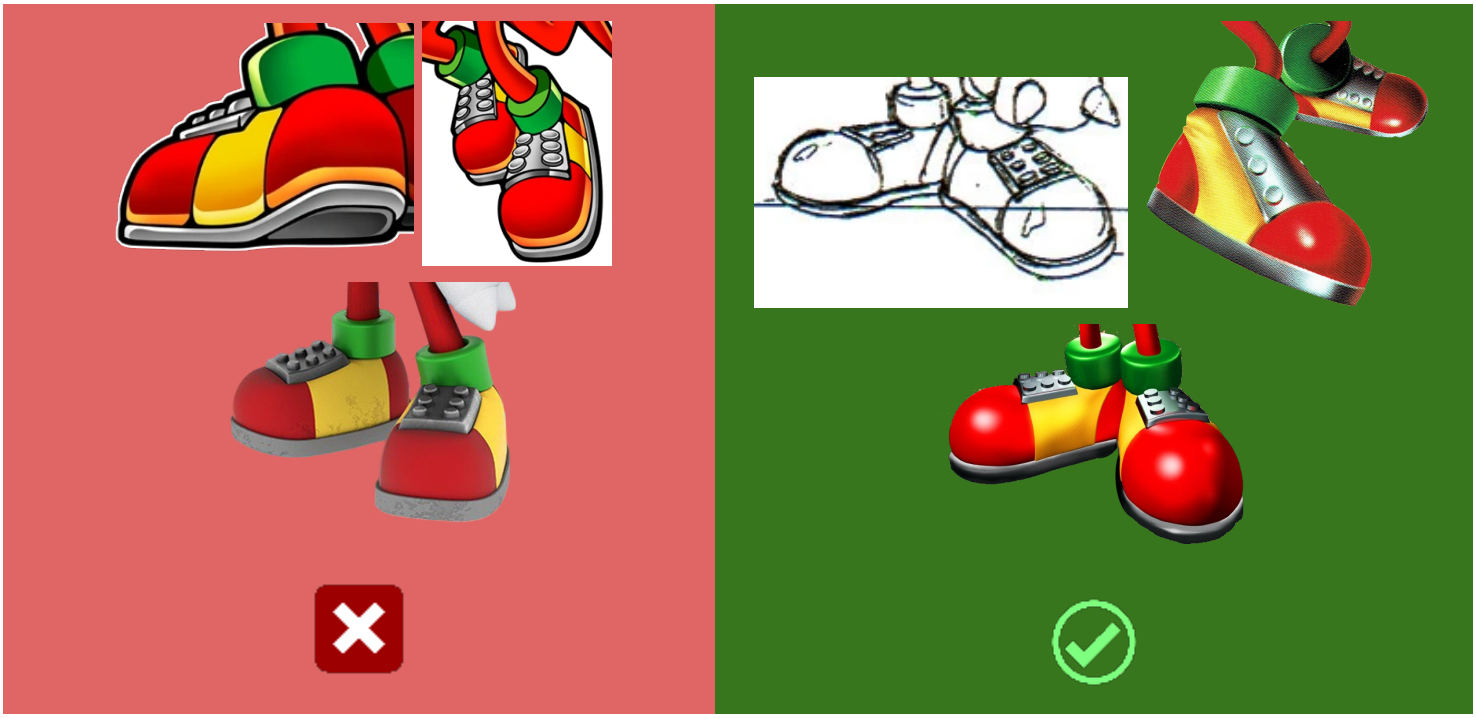
Originally, Knuckles's shoes also resembled clown shoes with a unique yellow pattern, constructed more similarly to that of a more typical shoe with the toe being a desperate part, and a hemisphere shape on the back. With a piece of Sonic Channel art having Knuckles in alternate shoes based on his typical ones having this type of typical shoe construction.

After a point of time though Knuckles' Shoes end up looking more like Sandals with a strap over them like Big The Cat or Tikal.

Another important part of Knuckles’ shoes is the
polished metal plate of armor bolted on the top, resembling a real type of armor plated boots.



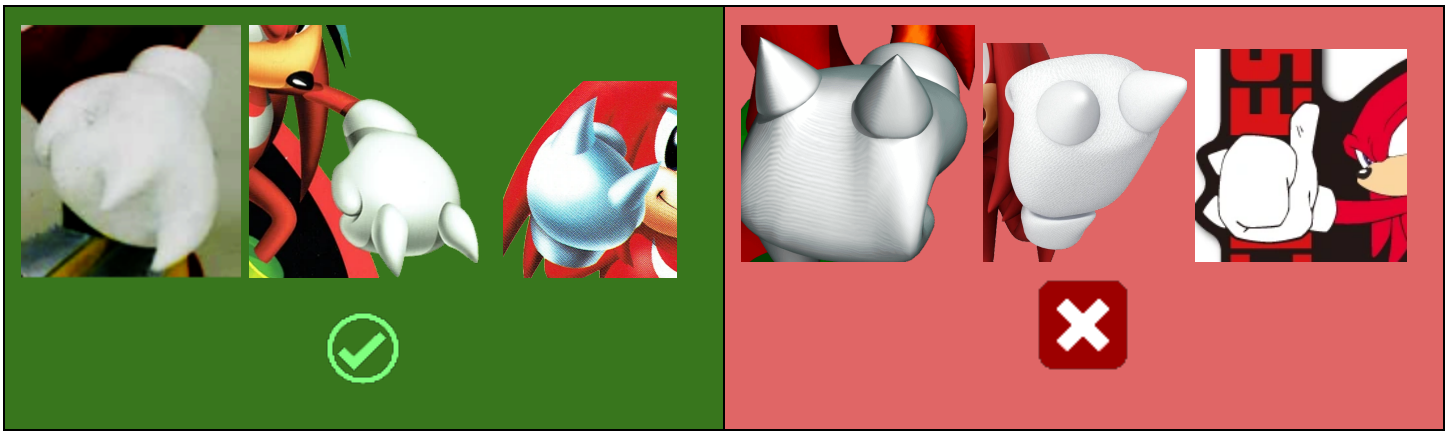
As can be seen on the second type of armored boot that has the metal plate stops right before the toe of the shoe, logically to allow the toe to be able to bend. This is also how it was used in earlier appearances. However, after a period of time the metal plate started going majorly over the toe.



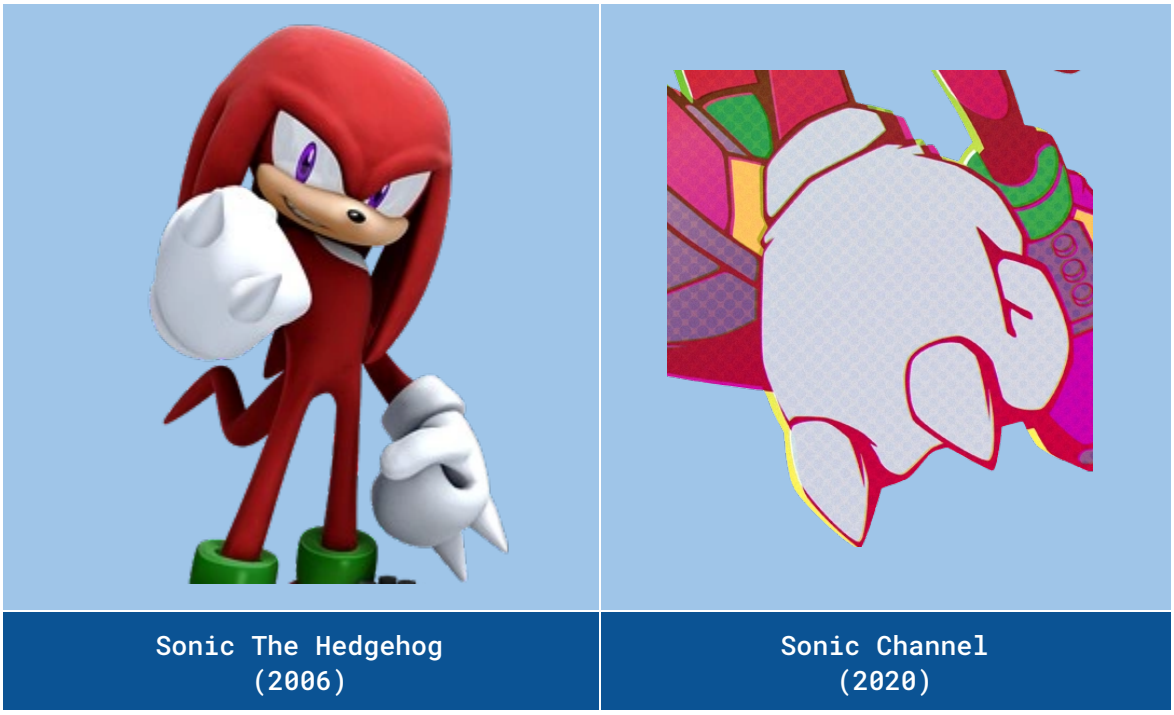
While it generally looks strange to have the metal plate extending over onto the toe area, it also creates noticeable problems when posing the character. In his current state, if Knuckles' needs to bend his foot, due to the clunky construction of the plate the entire piece awkwardly bends for the pose in comparison to the actual toe bending.

To note all of the issues mentioned in more modern renditions of Knuckles' shoes; both the shoe construction and metal plate are not present in his design seen in the Sonic The Hedgehog Movie franchise by Paramount. Although the movie design has excessive unnecessary detail, at least it retains some of what originally made Knuckles' boots work.

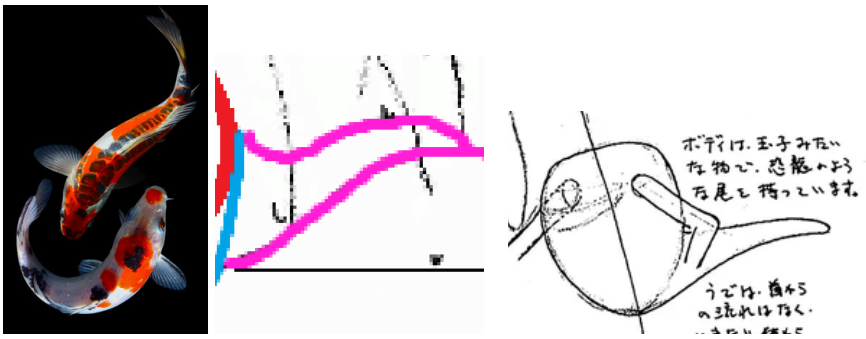
Older appearances of Knuckles had his titular knuckles much less wide and more curved like a claw similar to what a real echidna has, this helped make them appear more sharp and less like a superfluous extrusion on his hand.



His Knuckles returned to his longer and less wide construction in *Sonic The Hedgehog* (2006) but sadly was discarded for further game entries. Although they occasionally may appear in some of Yuji Uekawa's 2D art from Sonic Channel:



The tail of Knuckles The Echidna should resemble a Koi fish and constantly be in movement. This is a reference to Japanese folklore that is important to the character. Nagare Ryu.



Reference Sheet Rough Translation: “The body is shaped like an egg, with a koi-like tail.”

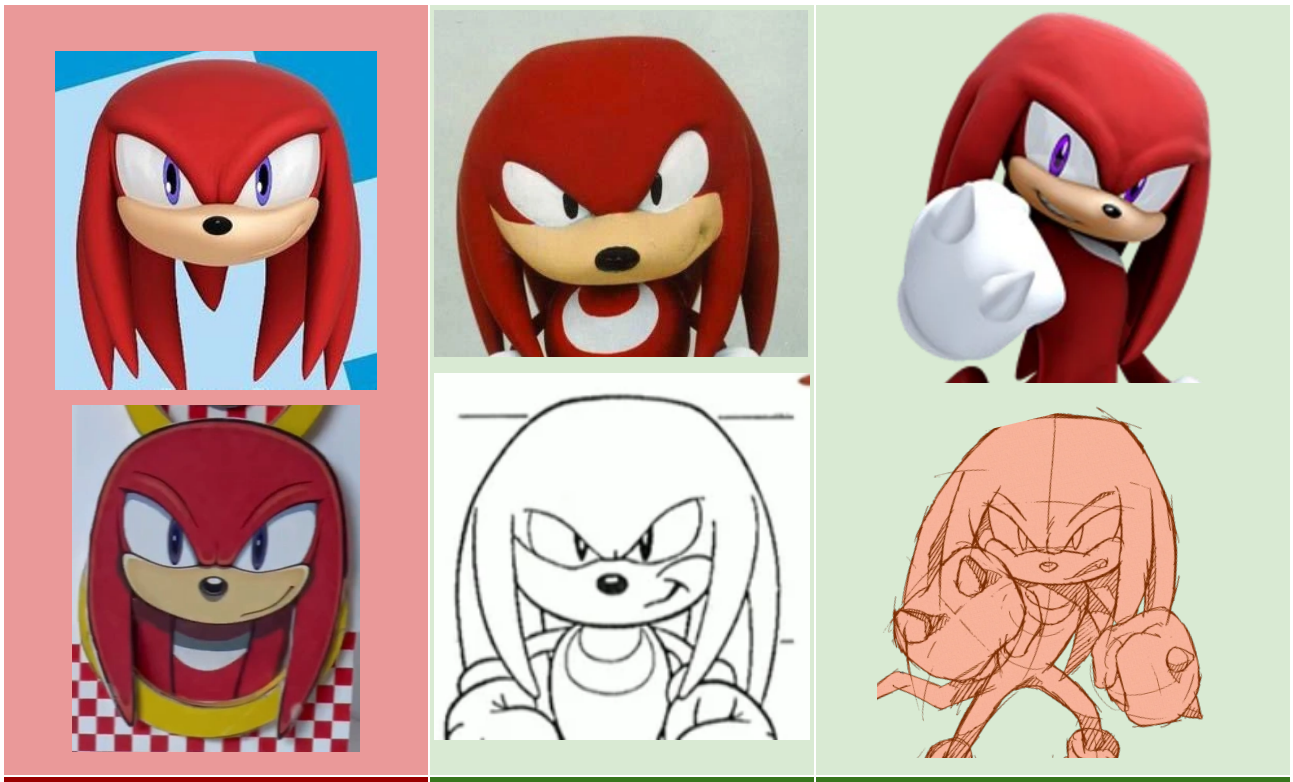
Often in modern interpretations, the tail is in a permanent harsh static zigzag shape, which greatly limits how the tail can be used both to express movement and character expression.

“The animated character should be as expressive for animation as an actor’s job in live action. Both should be masters of portraying emotions.” - Preston Blair: Advanced Animation

Like many other additions in current day Knuckles, the tail wasn't originally a permanent lighting shape as well in the first appearances of the "modern" redesign as can be seen in the below examples:

This feature also made a return in the Paramount Movie Design as is shown in the examples below:

Last but not least, possibly the most important part of Knuckles is his extremely unique head and face construction.



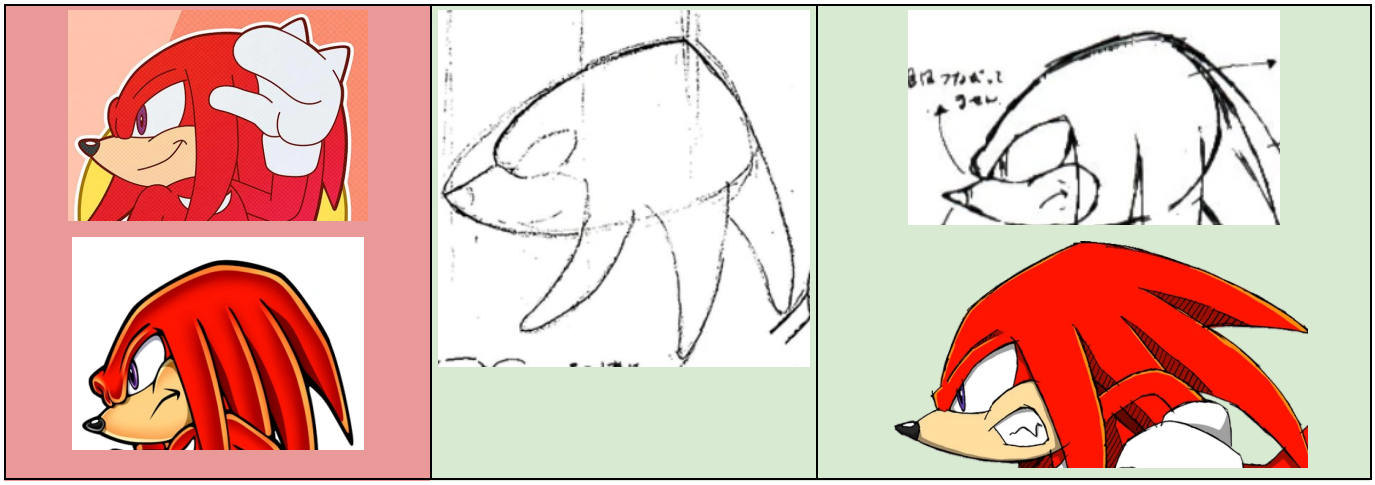
Modern Stock Art	Sonic 3 Era Reference Material	Sonic 06 & Sonic Channel (2006) (2010)

Knuckles' head is a very unique specific shape of his head similar to that of a Mole (which as mentioned earlier he once was in his earlier designs), having a large, very boxy forehead that tapers out and down like a trapezoid from the front.

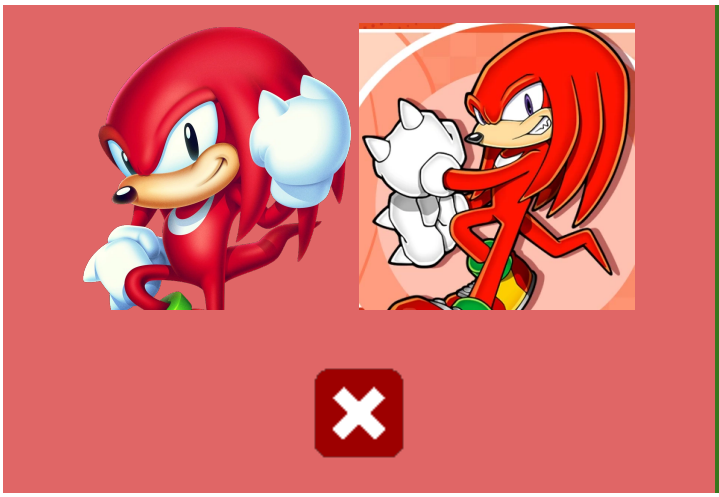
As well as a Sharp Decline on the side profile from the top of the head to the snout, similar to the one of a mole.

However, a lot of more recent usages of Knuckles heads have been varying levels of roundness, most especially evident when viewed on the side but also a 3/4th side angle, making the silhouette much weaker.

Reference Sheet Rough Translation: “Unlike Sonic, the head shape isn’t entirely spherical”



Misc Modern Stock Art	Sonic 3 Era - Ref Sheet	Sonic Adventure Ref Sheet (1998) Sonic Channel (2011)
✗	✓	✓



It is also important for Knuckles to have a boxy shape, not just in the top of the head itself but also the structure of the dreads. Fanning the dreads outwards rather than in a straight line helps accentuate his shaping and further shows his boxy head as well as a better sense of flow and motion.

However, an important thing to note with the dreads is to be careful when posing the dread in the back of his head. Since it's all the way on the back of the head, if it is shown in some angles it not only makes his head feel round but also completely breaks perspective in his head. In 3D seeing all 3 of Knuckles' Dreads is already a rarity due to perspective but is commonly slightly moved for appeal in 2D.

However when showing 4 dreads all the form in his head completely breaks and makes no sense in a 3D space, resulting in a non euclidean and bad looking silhouette. Knuckles' 4th back dread should only be seen when viewed from the side when fanning out for motion, viewed near the back of the head, or high at the top.

Also regarding Knuckles' dreads, it is important to know to not make the point where they start going off the head too high up, especially notable for Classic Knuckles due to his shorter dreads. This is due to the fact that if they start being posed their high up point of rotational origin can cause an odd "Bald" look, and is generally advised to not connect the dreads all the way up to the eyebrow as is done currently:

✓	✗
Sonic 3 & Knuckles (1994)	Sonic Superstars (2011)

✓	✗
SegaSonic Stock Art (90s)	Modern Stock Art

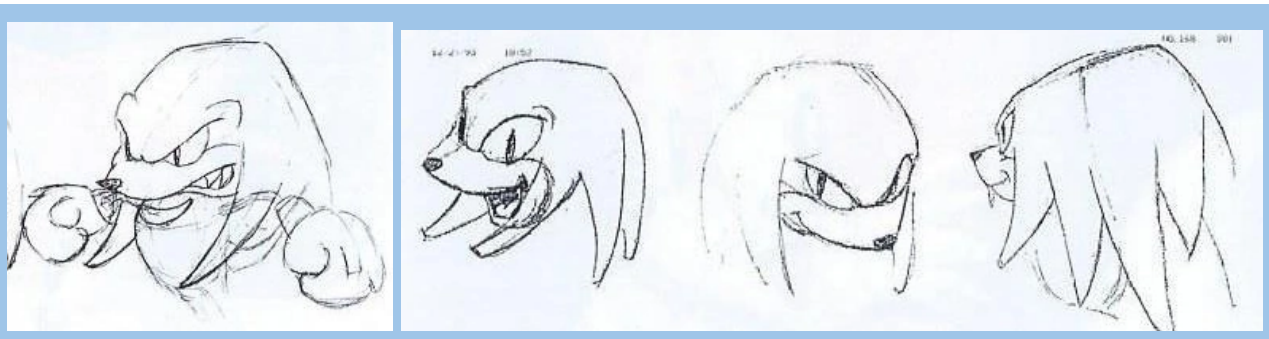
It is suggested that instead the dreads connect somewhere between the cheek area and the middle of the eye to avoid any awkward looking rotations and views at the underside of his head, as is done in Classic Knuckles' Original Appearance as well as art of Modern Knuckles by Tyson Hess.

Sonic The Hedgehog 3
(1994)

IDW Sonic & Team Sonic Racing Overdrive
(Issue 3 Cover 2018) (2019)

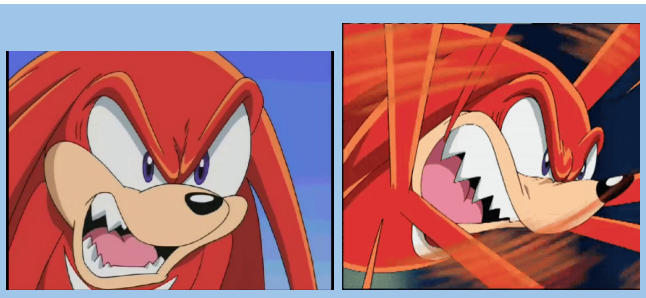
Art by Tyson Hess

The last important thing to note about Knuckles is his mouth. Unlike other Sonic characters, Knuckles obviously has a long mole-like snout as discussed earlier. Due to this his character design was made with that in mind with any wider expressions to utilize his entire muzzle area as a large center jaw, and the side smirk even forming into the form of his snout then just floating on the side.



Sonic 3 Reference Material
(~1994)

These ideals within Knuckles' mouth expressions were also brought into the modern design most notably in *Sonic X*, and even more so in Sonic Riders being featured as part of his main attack in, where he yells at the opponent riders.

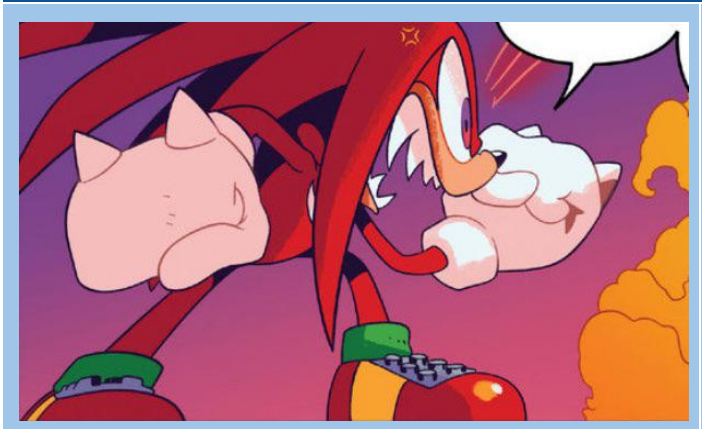


Sonic X
(2004)

Sonic Riders
(2006)

It has also continued to used well in the current day for both Modern and Classic in the IDW Sonic comics:

IDW Sonic Comics



Sonic the Hedgehog's 900th Adventure
(2023)

Sonic the Hedgehog: Knuckles' 30th Anniversary Special
(2024)

As well as being utilized for comedic effect in 2D animations directed by Tyson Hess:

Sonic Origins
(2022)

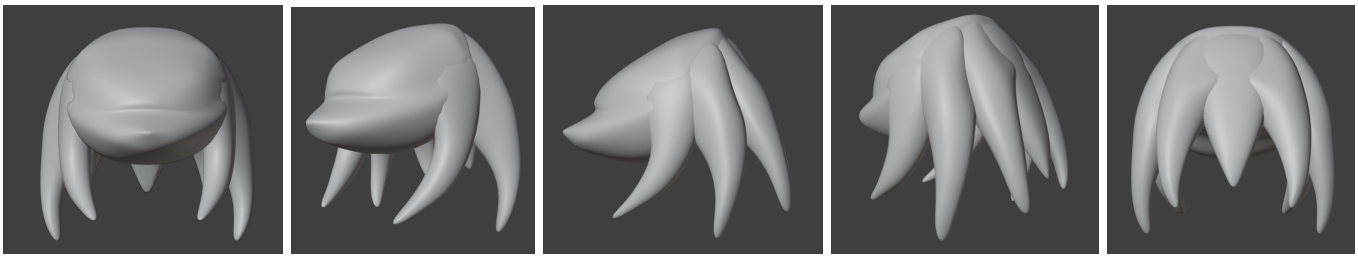
Sonic Mania Adventures
(2018)

This all being said however, most current appearances of Knuckles both classic and modern have not been utilizing Knuckles' large snout and jaw correctly, instead having an awkwardly positioned permanent side mouth regardless of the expression which mixed with not using his iconic sharp teeth leads to extremely stiff expressions:

Even more neutral faces are weaker due to the fact that his side mouth rather than conforming to the shape of where his jaw would be near the bottom of the face making an implied tangent into the full jaw is placed haphazardly on the side, an issue which again effects both modern and classic versions of the character:

It is generally important to remember that Knuckles' design is based very heavily within 3D form and where a lot of his appeal comes from. From his unique head shape, to the way his dreads work to his exaggerated expressions they are all very dependent on utilizing the 3D shapes and mass that makes up his design.

To end out his section to help understand the construction of the character better here is a blockout of Knuckles key shapes in 3D to give insight on his 3D form:



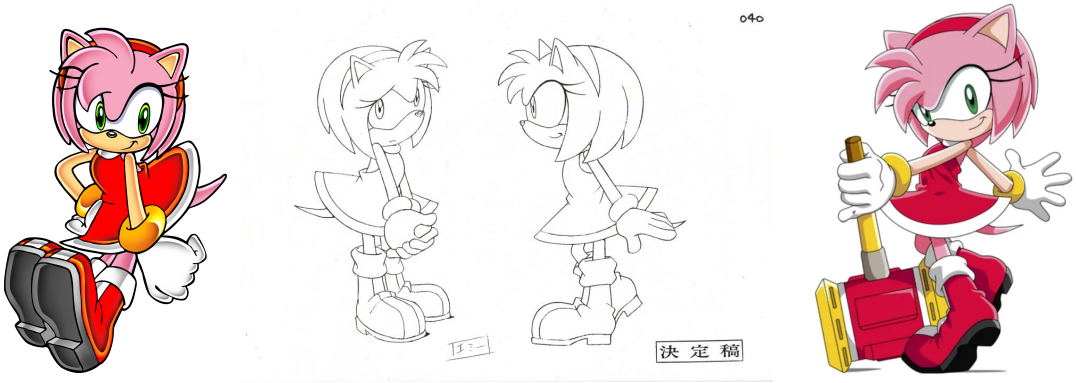
AMY

AMY ROSE

Amy's design is, generally, very basic, and very similar to Sonic. The shapes of their bodies and skulls are the same. While Sonic is the main star of the show, Amy is his lover, similarly to Mickey Mouse.

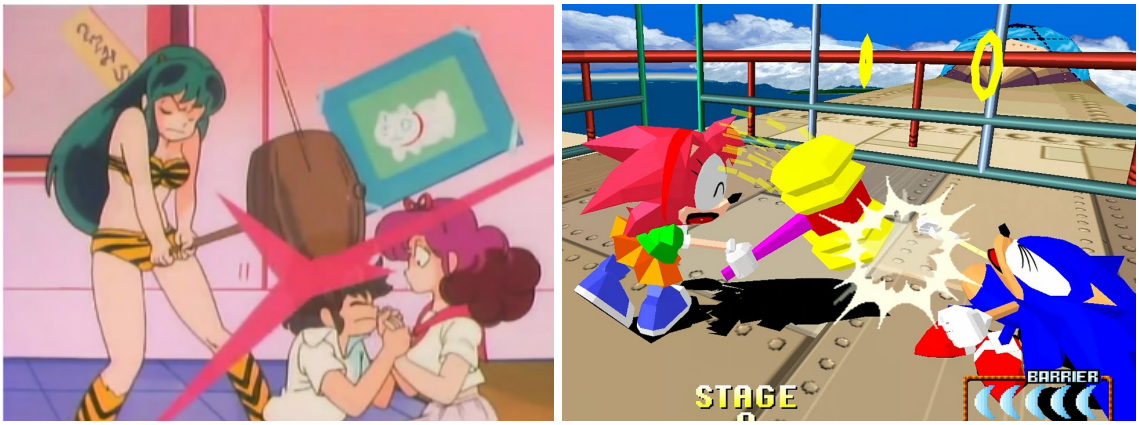
What's interesting about Amy's design is her outfit and what it suggests about her character. Amy originally was mostly a secondary character that was created for the storyline in Sonic CD, but as soon as Sonic Adventure started being considered, a redesign for Amy was brought up as a necessity, as Amy contrasted poorly with the main cast. As such Sonic Team started experimenting with her design until finding something that truly fit their vision. Amy was meant to be more of an explorer, a character with her own goals and one who lives on their own, yet still really loves Sonic.

The reason Amy in Sonic Adventure admires Sonic so much is because she wants to live a similar lifestyle to Sonic. She wants to be confident, assertive, physically active, and adventurous. Her outfit is a reflection of that desire. To reflect that, a few changes were also made to her design.



Amy wears a headwrap, seemingly to keep her larger quills from blowing around in the wind. Her dress resembles a tennis dress, with a minimalist fabric pattern and a shorter skirt for more moveability. These clothes suggest physical activity while still appearing cute and feminine. An attire fit for being Sonic's duo personality wise. Amy, much like Sonic, gives off pretty normal first impressions until you actually see how she behaves, which is part of the appeal of the character. An interesting thing to note is that for a while Disney female mascot characters utilised the Tennis outfit at the time.

The Piko Piko Hammer which first started being her trait in Sonic The Fighters alongside is a very likely reference to silly romcom gags such as the ones in Urusei Yatsura and Lupin III.

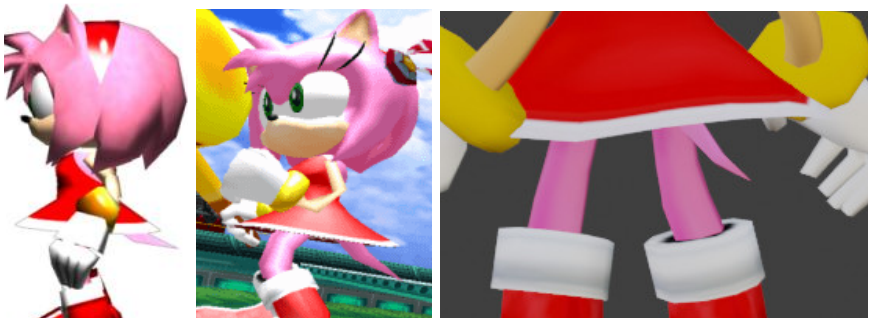


The skirt is a tennis skirt, while the “bell” shape is a frilly petticoat underneath.This keeps the skirt in a somewhat bell shape despite Amy’s maneuvers.

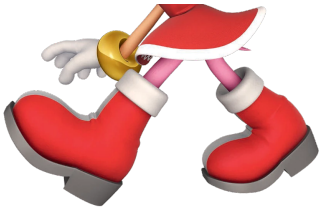
However, a lot of the shape language regarding the flexibility of the skirt was lost due to literal interpretations of what Amy was wearing. Lots of people treat it like a fixed bowl, when it’s not the case at all.

Amy’s skirt is meant to have a wave-like motion behind it, which varies according to wind and movement. The skirt is very light, as it allows for athletic movements and such. Normal petticoats are supposed to merely keep the round shape, not stop all movement from the skirt. It would be normal for the petticoat to also appear underneath the skirt, as it often does in 2D artwork. It is firm but not overly firm.

The petticoat bell shape allows her exceptionally long tail to poke out from underneath, so that she still has a distinct animal-like feature despite the human hairstyle and clothes.



Unfortunately, this doesn’t happen in current depictions anymore because her tail isn’t long enough to appear, for no apparent reason.



Similarly, Amy's back quill disappeared, which characteristically made her look more hedgehog-esque. Possibly as a design choice to make her look more like the humans in the city but still a choice nonetheless that takes away the fun of the cartoon hedgehog concept.

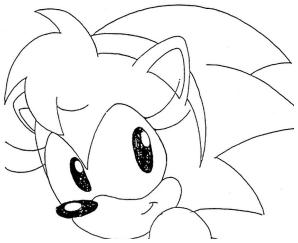
Arguably a very similar argument can be made about Amy's nose being so subdued in comparison to Sonic's, but it is a design preference.

Amy wears tall boots with low block-shaped heels and no fastening mechanisms, strongly resembling go-go boots. Go-go boots first appeared in the 1960s and have stayed relevant in street fashion ever since. This trendy origin isn't as rebellious as Sonic's boots, but they're similarly elegant and sleek, and similarly loud and proud with the color red.

Amy also wears gold bracelets. In real life these are an icon of fortune and prosperity. It ties together with Amy's belief in fortune telling.

Amy's eyes are the same as Sonic's, with the only difference being the shape when at rest. Sonic is a very determined guy, so his face naturally rests in a slightly angry browposition. Amy is much more observant of the people around her and is more affectionate towards people around her, so her eyes are slightly rounder and wider than Sonic's eyes when at rest.

Amy's eyes look like a heart.



This is a detail which has been removed after Sonic Adventure, and has no reason to not make a return, given that each character is supposed to have unique traits that correlate to their personality.

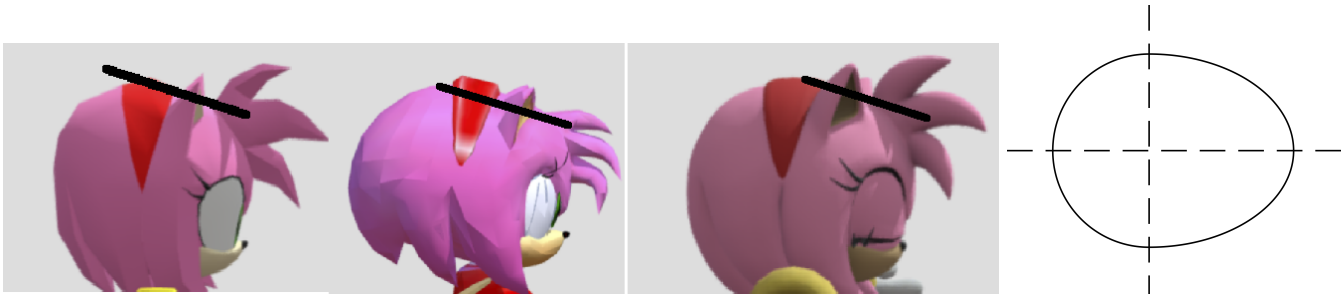
Amy creates a star shape when in motion through her quills, although due to the way Amy organizes her quills, it points downwards instead. It also highlights the separation between Amy's spherical head and her quills. Much like Sonic, Amy's torso is a sphere with a sack. Amy's last quill should be a bit more distant from the first two.

- Top Left: The ears are a bit more circular compared to Sonic's
- Top right: Again, the base of the head is a sphere.
- Bottom left: The nose is smaller than Sonic's.
- Right bottom top: There are 5 quills in total.
- Right bottom middle: No quills on the back.
- Right bottom: There is a tail (a bit bigger than Sonic's)

Amy's hair cuffs are often misinterpreted to be square shaped but that's not the case. The hair cuffs are a spherical attachment to the forehead in the shape of a pinwheel.

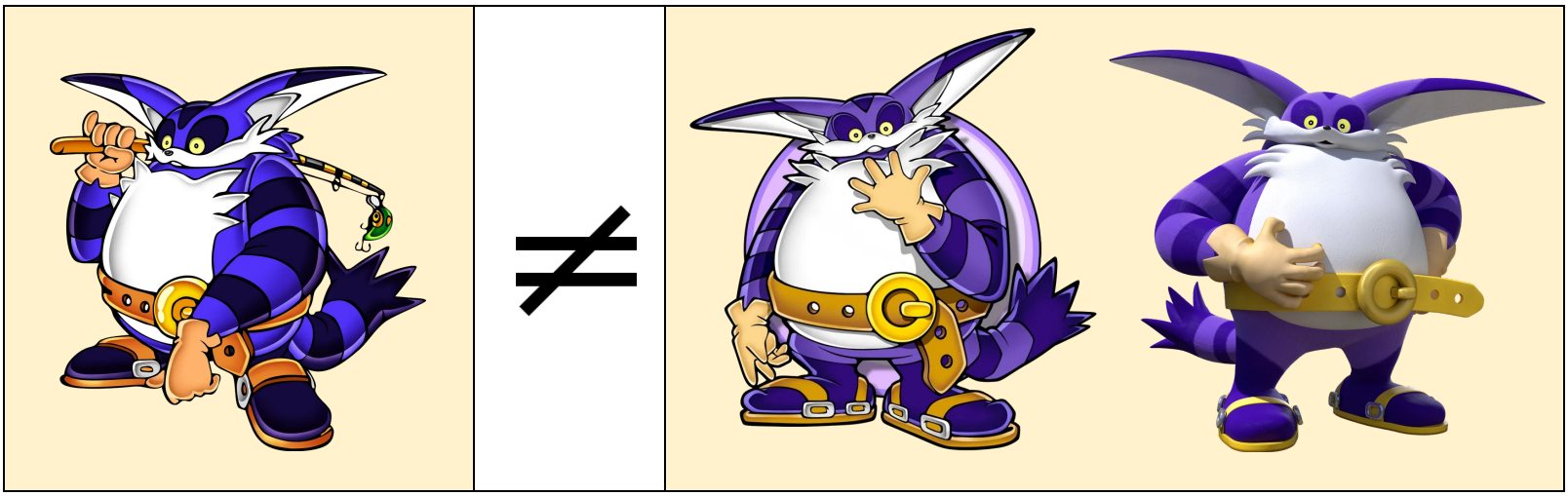
Amy's eyeliner also is present. Amy doesn't just have big eyelashes, but also very present eyeliners. Don't forget this detail as it can take some charm away from how Amy looks personality wise.

Amy Rose also has a unique characteristic in regards to 3D depictions after Sonic Adventure 1. It is pretty explicit that Amy Rose's head is an oval in the concept art and in more finalized touch ups of the design present in Sonic X. However, this same feature got misinterpreted as if Amy's hair grows upwards as soon as Sonic Adventure 2..



BIG
THE CAT

Big the Cat is a rather simple character who has had some slight differences over the years even if subtle. His colors used to be generally a bit higher contrast with his main color being more of a blueish purple, as well as being slightly less tall with much more prominent taller legs. Most of the issues are particularly an issue and mostly go down to taste but where important to point out nonetheless.



In terms of critique it is important to know that Big's unique mouth and eye shape is not a limitation, but rather as a distinct character design. It showcases the personality of Big The Cat with his blank expression and simple cat-like mouth showing his laid-back personality. Changing his face to be more "typical" removes a lot of specific appeal.

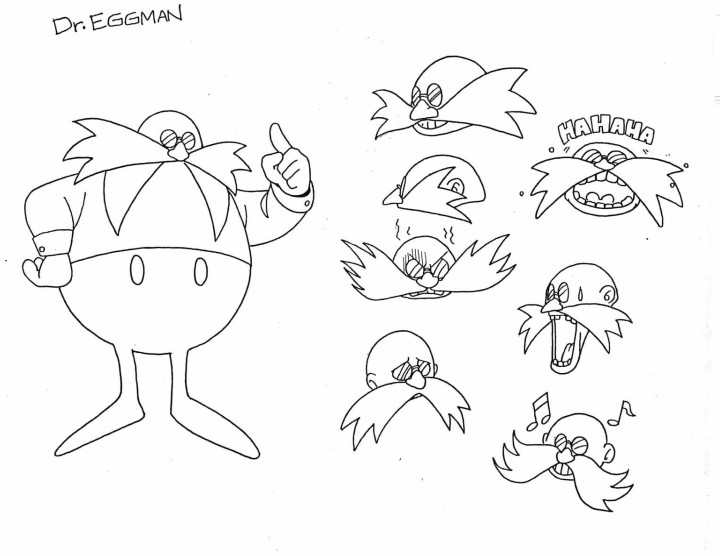
Dr.EGGMAN

Eggman is both at the same time a very simple and a very complex character. There are many facets to Eggman's design as Eggman is the main human antagonist and set the standard for other humans in the franchise. Since Modern Eggman is perhaps the most different compared to his cClassic counterpart, first Classic's design will be gone over before discussing how his *Sonic Adventure* design adapts those fundamentals.

Eggman's inspirations are the same as Sonic himself, he follows the pattern of fusion between classic golden era of western cartoons and japanese anime as well as cultural folktales. Eggman uses many of the same sources of inspiration but put through a different lens to be his polar opposite.

The best and easiest place to start with that comparison is Santa Claus. As mentioned many times prior, many aspects of Sonic are inspired by Santa, but so is Doctor Eggman himself.

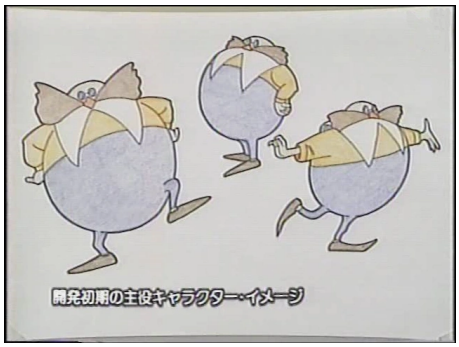
Both Eggman and Santa are large jolly men known for their large facial hair who wear red and black. Eggman however is meant to be a subversion to Santa down to his laugh “Ohohoho” being the opposite of Santa’s “Hohoho!” While Santa likes to spread his presents and joy with others just for the pleasure of helping and giving, Eggman sees toys and presents as opportunities to expand his empire. This is a major part as to why Eggman’s robots are childish and toy-esce and will be further elaborated on in the robot section: [Robots / Badniks](#).



As for Eggman's western cartoon inspiration he is heavily based on the characters Tweedle Dee and Tweedle Dum from the 1951 animated film *Alice in Wonderland*. Eggman shares their large oversized collar, red nose, clothing and of course their egg-like body shape. His concept art for the first game is even closer in appearance with the oversized collar being white and going over the pants, as well as having visible socks and separate shoes.

This inspiration similarly to how Santa is used highlights Eggman's childish thinking and demeanor.

Alice in Wonderland (1951)



Sonic The Hedgehog Concept art (~1990)

Sonic The Hedgehog (1991)

Another influence from Alice in Wonderland is the iconic Cheshire Cat and his famous grin which is so famous it itself is a term in animation to describe wide toothy grins. This of course is also where Eggman gets his signature grin from.

Also regarding *Alice in Wonderland*, whilst more vague Eggman might also be based on the Walrus from the movie. The Walrus is similarly a large egg-shaped character with a large bushy moustache and red nose who wears similar type of clothing and the addition of gloves which Tweedle Dee & Dum did not.
Important to note Eggman generally has lots of connections to Walruses. When his face is hidden as is often shown in Classic art the large collar appearing from under his moustache gives the appearance of large Tusks.

Furthermore, Eggman shares connections to the song from famous band **The Beatles**, *"I Am the Walrus"*. In which which the lyrics state,

> "I am the egg man
> They are the egg men
> I am the walrus
> Goo goo g'joob"
>
> - **I Am the Walrus, Song by The Beatles · 1967**

These lyrics seem to have also later referenced Dr. Eggman's theme song in *Sonic Adventure 2*. With the main chorus of the song being,

> "I am the Eggman, that's what I am
> I am the Eggman, I got the master plan
> I am the Eggman, that's what I am
> I am the Eggman, with the master plan"
>
> - **E.G.G.M.A.N., Composed by Jun Senuoe, Lyrics by Paul Shortino, Arranged by Jun Senuoe, Preformed by Paul Shortino · 2001**

While moving on, please keep Eggman's relation to **The Beatles** in mind, as we will return to them when discussing Modern Eggman.

The last major inspiration for Dr. Eggman is of course Classic Anime. Eggman's iconic bald head, tiny glasses and large moustache is a classic anime trope. This trope can notably be seen in the Manga and Anime series Lupin The Third by author *Monkey Punch*. Other examples can be seen in the anime *Muteking, The Dashing Warrior*.

Various Lupin III Characters

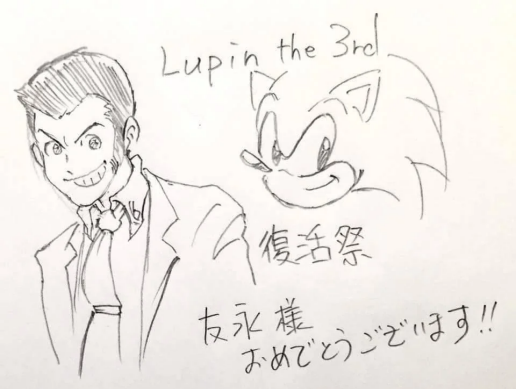
Muteking, The Dashing Warrior Characters

It is important to note that Lupin The Third is one of Sonic's most important anime inspirations as it is a personal favorite of **Naoto Ohshima.** He has expressed many times the importance of the series to him and its impact on his work. As such you will continue to see the influence from *Lupin* and general work from *Monkey Punch* in the oncoming sections, most especially within the humans.

“モンキーパンチ先生！！
ルパン三世は私に大きな影響を頂きました。
ありがとうございましました。
#モンキーパンチ 先生”

Monkey Punch-sensei!!
Lupin the Third had a profound influence on me.
Thank you so very much.
#MonkeyPunch

Naoto Ohshima, Twitter.



Modern Eggman

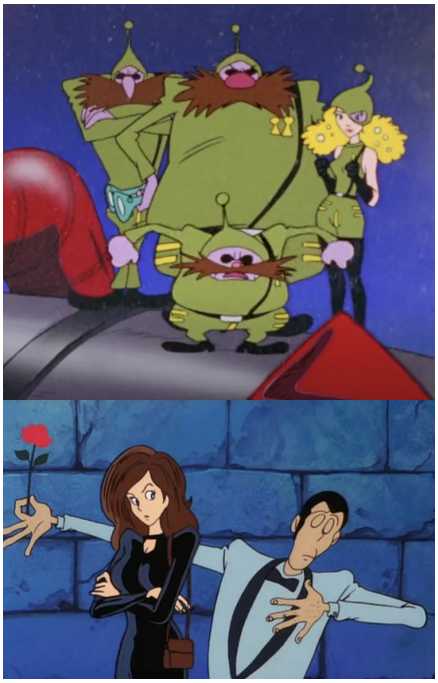
The version of Dr. Eggman made for Sonic Adventure onwards at first glance may seem very different in idea from his Classic counterpart however, for the most part this is not the case. He actually uses the same inspirational ideas but used in slightly different ways.

The most immediately obvious change from Classic to Modern is his outfit. Where he traded his Tweedle Dee and Tweedle Dum inspired fit (although it still does have some influence from it such as the large cuffs and high waist pants) for a large red jacket with white detailing connected to yellow buttons on each side.

This outfit change, similar to many aspects of Classic Eggman, was likely inspired by *The Beatles*. Specifically from the outfit worn by George Harrison for the art of the album Sgt. *Pepper's Lonely Hearts Club Band*. In which he can be seen

wearing a similar red jacket with white detailing, gold buttons and can even be seen donning a large mustache alongside the rest of the band with a similar appearance.

In regards to eggman's body shape, whilst he is still very much egg shaped from his *Alice In Wonderland* and Golden Age inspiration, he did however have some slight changes in his arms, shoulders and hands. He no longer has shorter tapered arms and smaller hands from the prior mentioned sources but rather longer skinny, large shoulder pads and larger hands. These changes in construction seem to like his new red jacket taking inspiration from another key inspiration to his Classic Design, that being *Lupin The Third* and *Muteking*. They both can be seen with large skinny arms, wide boxy shoulders and large cartoony hands. Of course all things that were incorporated in Eggman's new design. This type of body and limb construction will again be important when talking about general human design within the Sonic franchise.



Any other additions to Eggman's design seem to be brought on by the addition of the more detailed jacket to have consistent detail across the design as well as the general more detail given to apparel in Sonic Adventure.

Nu Classic Critique

Now that the origins of each Eggman design has been gone over. Focus will be shifted to what could be improved in current incarnations of each Design. Since Classic was of course first, it will be used as the starting point.

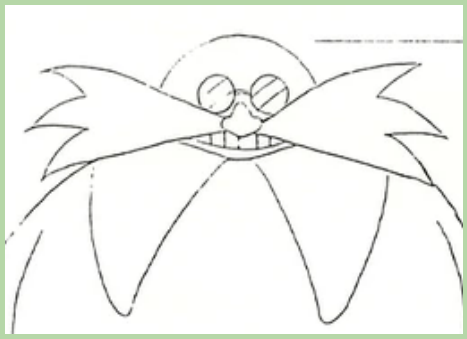
Classic Eggman, has stayed the closest to his original appearance and design philosophies out of every character in the Sonic franchise.

There are however still important things that should be noted. Every single critique for Classic Eggman has to do with his face.
The biggest issue Classic Eggman currently has is the size of his glasses being a bit large and close together.

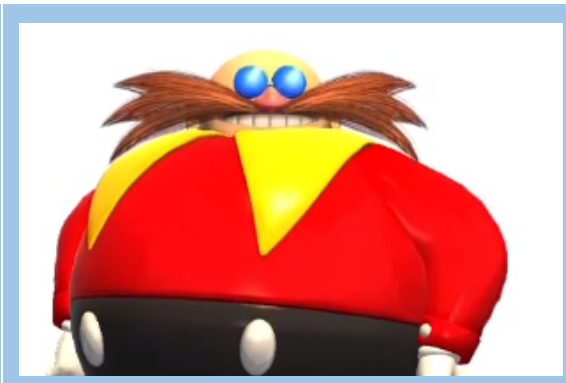
✓	✓	≈
Sonic CD (1993)	Sonic Superstars (2023)	Sonic Superstars (2023)

While glasses size have changed somewhat between different depictions he consistently within current depictions of Classic Eggman in 3D game depictions have had them pretty large. Despite this merchandise and 2D art (Sometimes even for the same game) have the glasses smaller and farther apart. If the glasses are too large and close together they can appear a bit *too* comical. Eggman works best when he can easily switch from silly to serious. With his unnatural grin and lack of facial expressions on the eyes because of the beady glasses giving him an uncanny imposing feel. This look is a lot harder to obtain when the glasses are too big.

On the topic of the glasses another iconic part of Eggman's design is the diagonal specular highlight. Similarly whilst continuing to be in the current 2D art, the 3D model appearances of Dr. Eggman has gotten rid of that design feature for a more general round highlight.

✓	✓	≈
		
Classic Eggman Reference Material (1993)	Sonic Superstars (2023)	Sonic Superstars (2023)

It is important to note for a small period of time when Classic Eggman was first reintroduced in *Sonic Generations* there were two different attempts at trying to get this look in 3D. The main character model had the highlight appear sometimes depending on the lighting but was very subtle and a bit hard to notice, with it most of the time just appearing like a round highlight.

	
Prominent Example (Sonic Generations)	Less Prominent Example (Sonic Generations)

Also in *Sonic Generations* the statue for Dr. Eggman found in the collection room can be found with extremely present textured reflection going across the glasses, being the closest visually to his original art even if static.

Sadly however, neither of these attempts to try and bring the horizontal highlight to 3D were iterated on any further with the character both ingame and in promotional art having no such highlight stylization.

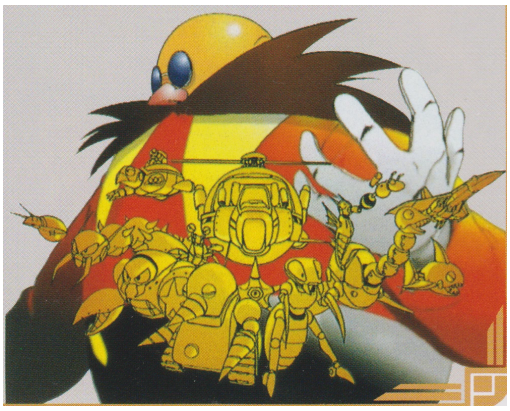
Sonic Superstars (ingame)

Sonic Superstars (Promotional Art)

Whilst size variation has been more common than the glasses, Eggman's mustache being large is of course a very important aspect of his character. In recent appearances however it is commonly on the smaller side, specifically in regards to the horizontal width. Similarly to the glasses this is mainly a problem in the 3D game depictions rather than in 2D or merchandise.

✓	✓	≈
Sonic The Hedgehog (1991)	Merchandise (2020s)	Sonic Generations (2011)

It is again very important to note that all discussed features of the glasses and moustache can sometimes appear different depending on the art piece depending on the composition and needs of the artist (for instance the highlights can sometimes purposefully exclude the highlight stripe to give a more dramatic feeling). The critique given is recommendations for what would consistently look the best as a base design for material such as a 3D model which will be consistently seen for a variety of uses in a singular game.



Modern Eggman Critique

Whilst Classic Eggman has mostly come out unscathed in his current appearances, sadly the same can't be same for the modern appearance of the character, as he has many more issues then his classic counterpoint that affect his design way more drastically.

The first and most immediately obvious of these issues is the size of his moustache. Whilst part of Modern Eggman originally was that he had a crazier and even larger moustache his current 3D appearances have it appear extremely small.

Sonic Rush (2005)

Sonic Riders (2006)

Team Sonic Racing (2019)

Despite Eggman's moustache being his most iconic and defining part of his design it has unfortunately been in this lacking state since the mid 2000s in all 3D Appearances. Not only being very small horizontally, but also vertically with it resembling a large horizontal rectangular strip rather than the large triangular "bowtie" like appearance it should.

Modern Stock Render

Mario & Sonic at the Olympic Games Render (2008)

The issue of the moustache size oddly enough has only affected Eggman's 3D appearances and has not been brought over to any of his 2D art, even to the present day.

Sonic Channel Art (2017)

Modern 2D Stock Art

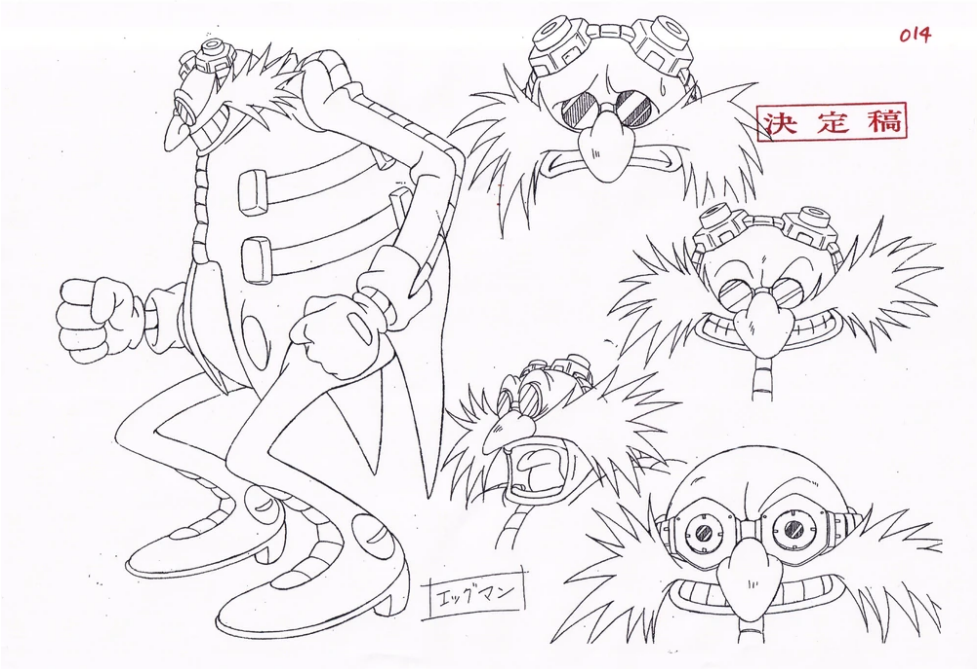
Super Sonic Drawing! #05
By Tomoko Kanemoto

The last thing to note about Eggman's moustache is that while it's most important to have his moustache be large and a bit wild. It's important to remember also to not go too overboard when constructing it as it still should be relatively simple even if it has more "points". Even with the bushier design keep in mind the classic Bowtie like shape, when overcomplicating the mustache it can even instead start to resemble rounder pom poms instead if done too much.

Sonic Channel Art (2024)

Modern 2D Stock Art

Arguably the other most important part about Eggman is his iconic toothy grin and other exaggerated mouth expressions. Unfortunately yet again a lot of current appearances of the character have not been capturing the appeal of that aspect of the character.



Dr. Eggman works best when he has little to no jaw, with his large mouth taking up a major amount of the room on his face for large bombastic expressions.

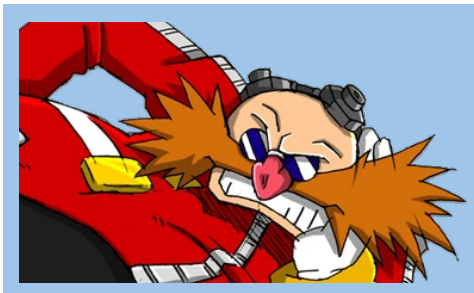
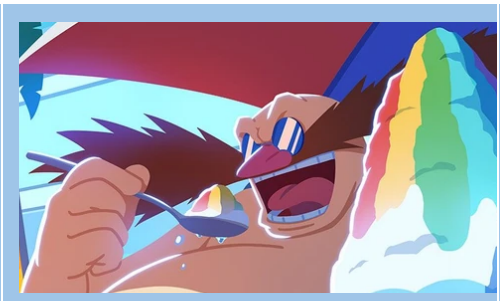
This has been a key part of his design from the 90s and 2000s:

Sonic Adventure (1998)

Sonic X (2004)

Sonic Riders (Adjusted Brightness) (2006)

As well as the 2D art of the modern day:

		
Sonic Channel Art (2011)	Sonic Channel Art (2022)	Modern 2D Stock art

However, similarly to the moustache all of Eggman's 3D appearances for decades have a notably smaller mouth and a large prominent chin and sometimes even a prominent neck, all greatly detracting from his iconic exaggerated mouth expressions.

Mario & Sonic at the London 2012 Olympic Games (2011)	Sonic Frontiers (2022)	Modern 3D Stock Art

It is key to remember that when Eggman is ever showing his mouth to have most of it taken up by the teeth and or inside of the mouth. But, the opposite is also very important. Just like Classic Eggman, during certain expressions (typically when trying to look serious, imposing or have a blank looking expression) Eggman's mouth is not visible at all with the last thing that can be seen is his nose and moustache.

Sonic Adventure
(1998)

Sonic X
(2004)

Sonic Riders Zero Gravity
(2008)

Currently however Eggman rarely pulls off this iconic expression unique to him, and if ever attempted it looks off due to not pulling down his head, showing his jaw, made even worse by the large size of it in his current 3D design

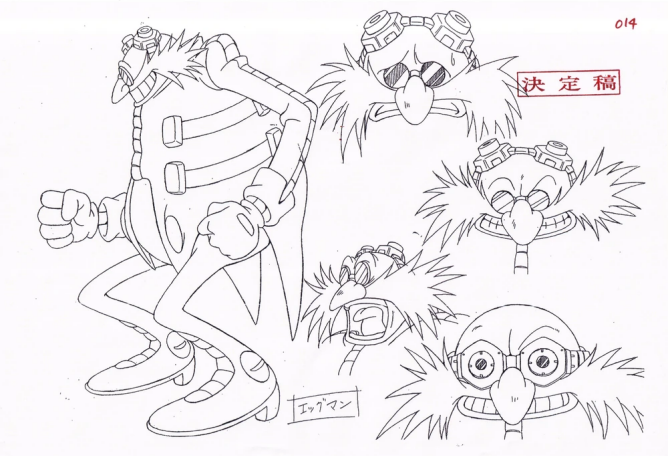
≈

Modern 3D Stock Art

Sonic Generations
(2011)

On the topic of Eggman's expressions it should also be noted that whilst Modern Eggman always present brows in comparison to Classic Eggman, he has more recently almost only been portrayed with them in a determined or angry expression with a wrinkle/ crease down the center, having very little emotional range, again mainly as a problem within 3D.
This especially becomes noticeable when he has more subdued expressions.

Eggman, similar to every other character in the franchise should have a full emotional range in his brows, rather than having a permanent angry look. Especially for a character like Eggman who, despite being the main antagonist of the franchise can often be a very comical character. The Sonic X model sheet is a great example of how he should look in other expressions as well as the examples below:



Sonic X
(2004)

Sonic Channel
(2014)

Sonic Colors Ultimate Promotional Comic Issue 2, Egg Planet Park
(2021)

Part of the reason why Eggman's expressions always feel angry is in part due to how large and thick and wide his brows are to begin with, making them always feel super intense even if not in a more neutral expression. It is highly recommended to soften his brows as a base and then adjust for expressions that need it.

Sonic Adventure 2 Battle (2001)

Sonic Riders (2006)

Sonic Riders Zero Gravity (2008)

Sonic Free Riders (2010)

The last important thing to note about Eggman's head is the proportions of his face which should be large but also evenly spread out along the head, leading to a smaller forehead. Current 3D appearances however have Eggman's entire face extremely squished with a very wide fat nose without prominent nostrils, very low down glasses that are more so on the side of the nose then on top of it and a very large forehead (despite some not even being an issue on the model used in the olympics games up until 2016).

Sonic Riders Zero Gravity (2008)

Sonic Colors Ultimate Promotional Comic Issue 2, Egg Planet Park (2021)

Mario and Sonic at the Rio 2016 Olympic Games (2016)

Sonic Forces (2017)

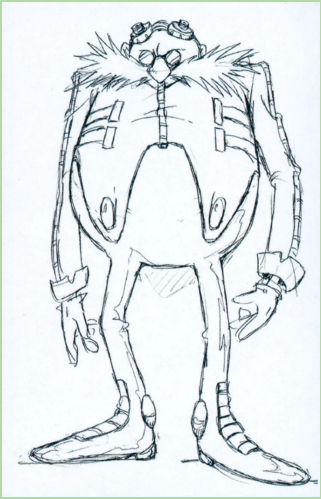
The last thing to note regarding Modern Eggman's head is that similarly to what was discussed in Eggman's [Nu Classic Critique]() , Modern Eggman doesn't typically ever have the iconic diagonal specular highlight in his glasses in 3D. Unlike Classic Eggman which had attempted to have it work in more modern 3D. Modern Eggman has not had a notable 3D game appearance with the diagonal specular since *Shadow The Hedgehog*.

✓	✓	≈
Sonic Advance 2 (2002)	Shadow The Hedgehog (2005)	Team Sonic Racing (2019)

Similarly to Classic Eggman this is not to say that more typical specular highlights should not ever be used for Modern Eggman, as blank glasses can be used well when going for a more menacing look such as the 3D artwork for *Sonic Adventure*. However, the horizontally striped specular is an iconic look of Eggman's glasses that has stayed all the way to the current day in 2D art and should be utilized in his 3D appearances as well.

Moving on from the head, probably the other biggest issue Modern Eggman has is an issue shared with many other characters in the cast. That being the issue of oversized hands as discussed in [Mistakes of the Hands]. Whilst of course Eggman's hands should be somewhat large and cartoony, their current size on the character in their modern 3D appearances is absurdly large. Larger appearances in older pieces of artwork were due to stylized foreshortening and perspective but seemed to have been used as the basis for their general size.

This leads to Eggman having heads that are massive, and completely engulf the size of his head even when more closed.

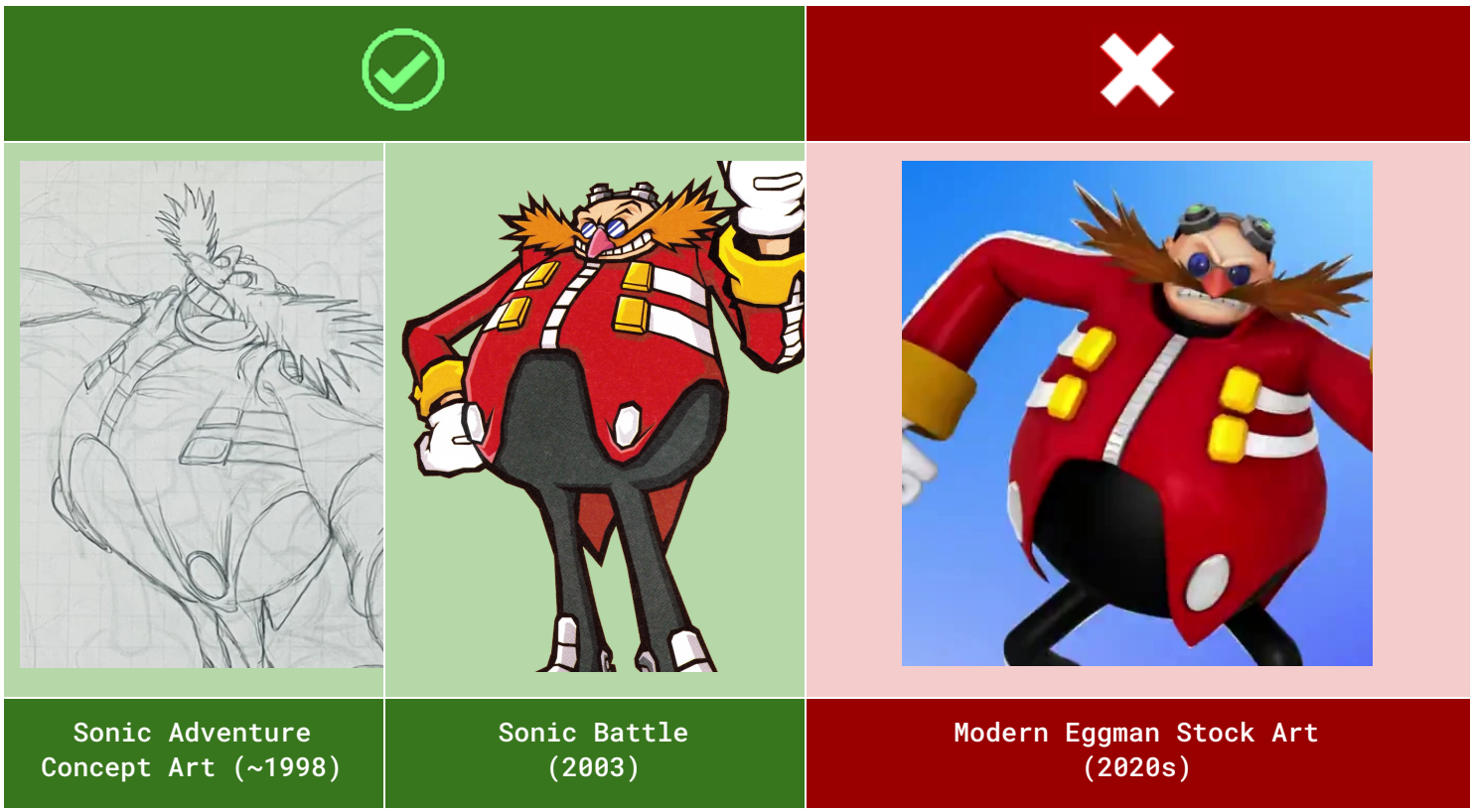
✓		✗	
			
Sonic Adventure Model Sheet (~1998)	Sonic Channel (2011) & (2020)	Stock Art (2010s)	Mario & Sonic at the Olympics Games Tokyo 2020 (2019)

Another issue Modern Eggman has is the lack of his large boxy shoulder pads, with his stock model instead having smaller rounder shoulders. Similarly to the issue with the face compression this was not an issue with the models used in the Olympic games up until 2016.

✓		✗
Sonic Channel (2010)	Mario and Sonic at the Rio 2016 Olympic Games (2016)	Modern Eggman Stock Art (2010s)

Moving on, a small but notable detail on Eggman is the two buttons on the front of the body. Whilst they first may give the appearance of being on the jacket themselves, they are actually supposed to be on the pants, just like the classic design with the front of the coat strapped onto them with minor stretching, similar to how one might strap overall buttons.

In the current day however, this may have seemed to be lost. With the front of the coat being loosely draping over the body with the buttons looking unattached to the pants.



The last thing to note about Modern Eggman is his foot area. The metal part on his foot originally was presented more as a piece of metal plating on the front that wrapped around the form of the foot. Most 3D appearances however present it more as an embedded piece inserted into an extruded hole which doesn't make as much sense for outfit construction and can appear odd.

In conclusion, Modern Eggman's design has continued to go strong in 2D art to the current day. Outside of the first two *Sonic Riders* games and aspects of his appearances in the *Mario & Sonic at the Olympic Games* series, Eggman has struggled to keep the appeal of his 2D art in 3D in the current day. The recent art of Eggman in Sonic Channel by Yui Karasuno
Has all especially shown what made Modern Eggman's design so appealing in the 90s and 2000s and is all highly recommend as reference from current day depictions of the character:

Sonic Channel art by Yui Karasuno (2022)

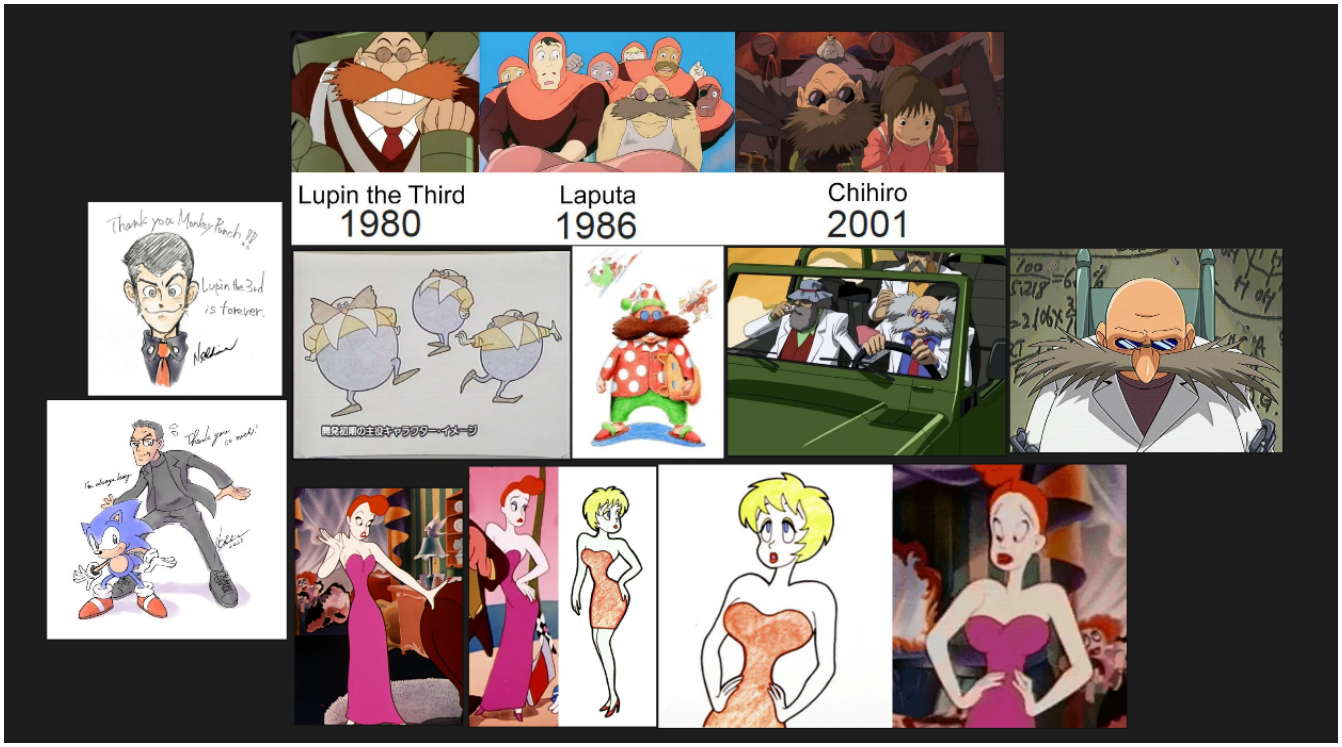
As a possible example we have created a mockup of what Modern Eggman could look like in the current day in 3D using the head of *Sonic Riders Zero Gravity* as a starting point and adding on additional design elements and proportions seen in Dr. Eggman's 2D art to compare to his current 3D appearances.

This example can be seen below on the next page:

Modern Eggman Mockup	Sonic Dream Team Render (2023)

Human design

The design of the human characters in Sonic The Hedgehog can't be summed up to a singular source. It's a variation of many different inspirations combined into a cohesive aesthetic through a simplification of real life that varies from comedic parody to cute simplicity.

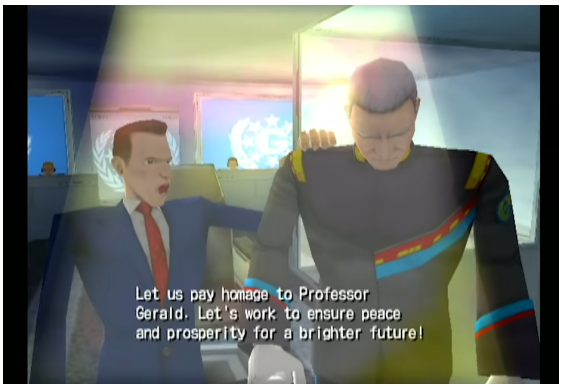


Most notable references are the character designs for Western Inspiration is Golden Age Disney while Eastern Inspiration is Yoichi Kotabe, Monkey Punch and Rumiko Takahashi.

Most Sonic The Hedgehog games made by the early Sonic Team didn't feature many humans. However, Sonic Team artists remained using the same references as they did for Sonic, outside of the Sonic series. This section will explain more thoroughly these influences.

Lupin The Third

However, as mentioned previously in Dr. Eggman's section of the work of the artist "Monkey Punch" is possibly the most important to the eastern influence of Sonic Team's Humans. Most clearly within structure and character proportions, this can be seen within their large-simple boxy bodies, lanky limbs and large stylized hands. This type of character design was heavily influenced by the golden age of animation on the west and the MAD magazine caricatures.

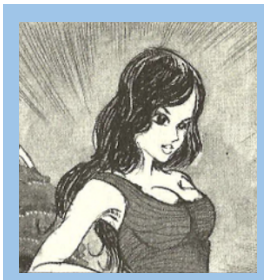


As previously mentioned this can especially be seen within Dr. Eggman where the stylization of humans can be so similar Lupin works sometimes have Dr. Eggman look-alikes:

Lupin III: Angel Tactics

Sonic X

These same sorts of influences can be seen within Sonic Team's games such as *Nights Into Dreams*.



Lupin III art	Nights Into Dreams art

As a final side not on *Lupin*, it's long line of animes, movies and TV specials are all primarily animated by Tokyo Movie Shinsha, more commonly known as TMS Entertainment which since the 90s has been owned by SEGA, and as such you might recognize as the animation studio behind *Sonic X*.

Due to the same team of artists and animators working on both this coincidentially went full circle in terms of Lupin's inspiration for Sonic and as such Lupin's anime output in the 2000s is quite similar visually to *Sonic X*.

Lupin III: Operation Return the Treasure
(2003)

Sonic X
(2003)

The two are so similar in fact that TMS hid Lupin and Fujiko (another character from the franchise) in the crowd of the first episode of Sonic X, with them completely blending into the crowd. Whilst completely circumstantial that SEGA ended up buying TMS to let these series of events to happen it shows how visually linked Sonic is to the Lupin franchise.

Even SEGA's Marza Animation Planet has recently worked on the franchise having made Lupin's first CGI movie: *Lupin The Third: The First*. Displaying how one of the main CG studios working on the Sonic franchise similarly adapted humans that fit Sonic's world into modern 3DCG.

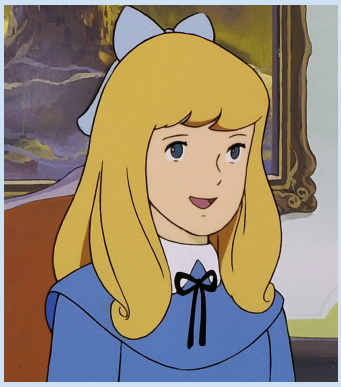
Without Lupin the Third there would be no Sonic in the first place, and that isn't an exaggeration. A lot of the mannerisms from Sonic, Rouge, Eggman and many others are direct references to Lupin The Third's cartoony dynamics between the characters as well. This inspiration goes beyond character design, but also clearly is an important aspect of it as well for Sonic Team as a whole.

W.M.T and Beyond

Another big influence on how Sonic Team often drew human characters came from the World Masterpiece Theater project. This project was a big movement in Japan to bring some of the best staff from their animation industry together to make adaptations of classic western novels. One of the main artists behind what would eventually become a widespread aesthetic of this type of adaptation that would soon get mainstream adoption through the efforts of amazing directors like Isao Takahata and Hayao Miyazaki which ended up leading to the creation of Studio Ghibli that only further popularized and evolved this style came initially from the work of artist Yoichi Kotabe.

Kotabe’s style chosen for this is quite simple to understand. It depicts humans in an often cute small eyed manner that is still stylized but not too exaggerated to take away from their cuter features. In a story about human sensibilities and emotions, the often extreme exaggeration of features for comedic purposes suddenly didn’t fit as much, leading to this stylization of reality that is still recognizable as a cute cartoon, while still feeling real. This style drew clear influence from classic animation from the west, while distinctly having a more soft sensibility from japanese animation.

Although this style is not as present in what we associate often with Sonic after Sonic Adventure 1, a big influence from it can be seen in Sonic Team's earlier works such as the conceptual internal artwork for Sonic 1 and the Phantasy Star series. It is factual that Sonic Team used not only this style, but the work of Takahata, Miyazaki and Kotabe as an influence for their games. One of the most famous examples is Sonic 3 directly referencing "The Castle in the Sky", or the countless references throughout the series history to "Lupin III: The Castle of Cagliostro" in games even after the 90's such as "Sonic And The Secret Rings", "Sonic And The Black Knight" and "Sonic The Hedgehog (2006). The character for Maria in Sonic Adventure 2 shares similarities design wise to the character Clara Sesemann from Heidi: "Girl of The Alps".

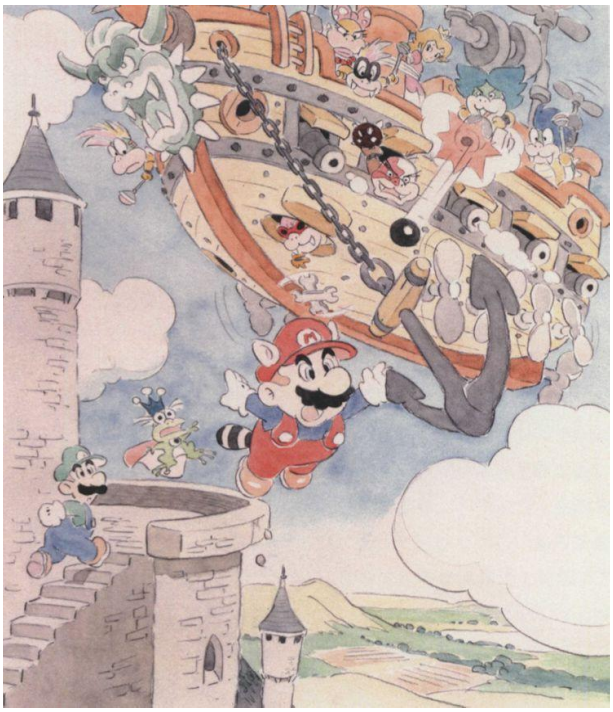


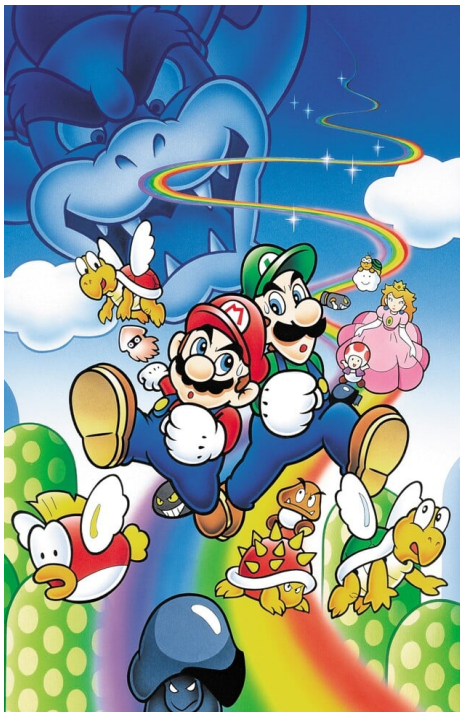
Alps Heidi no Shoujo - Clara Sesemann

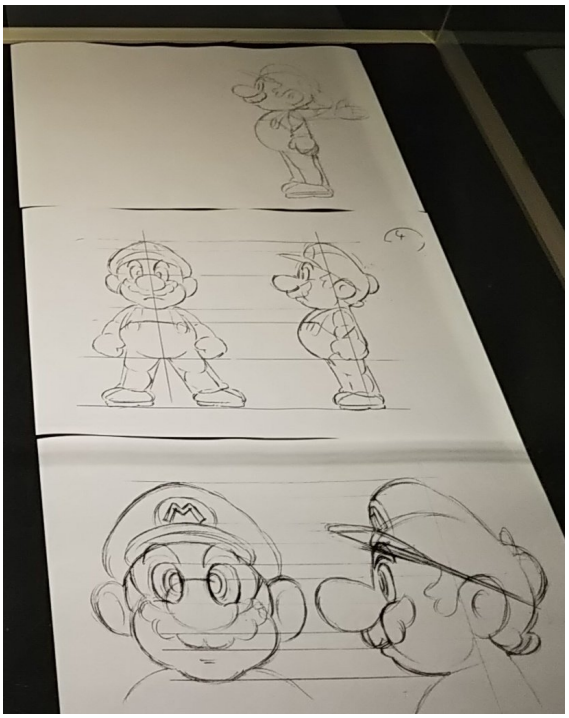
Lupin III: The Castle of Cagliostro - Clarisse d' Cagliostro

Panda Ko Panda - Mimiko

As a last note on Yoichi Kotabe's influence on Sonic, he was also the person tasked with redesigning the Super Mario cast from the original designs created by internal Nintendo staff, into what we now know as of today as one of the most iconic and beloved things ever to be associated with a videogame ever made. It should be no surprise to anybody that the Mario series had an influence on Sonic Team's creative workflow, so Kotabe's influence on Sonic is near undeniable.



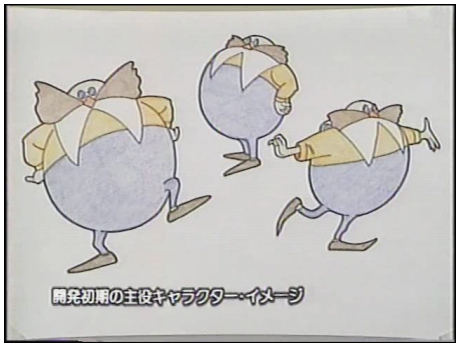




Disney

It is widely well known that the humans of the Sonic The Hedgehog franchise are also heavily influenced by classic western animation. As mentioned prior *Alice in Wonderland* (a story which is still very popular in Japan today), was a major influence for the design of Eggman for the first sonic game:

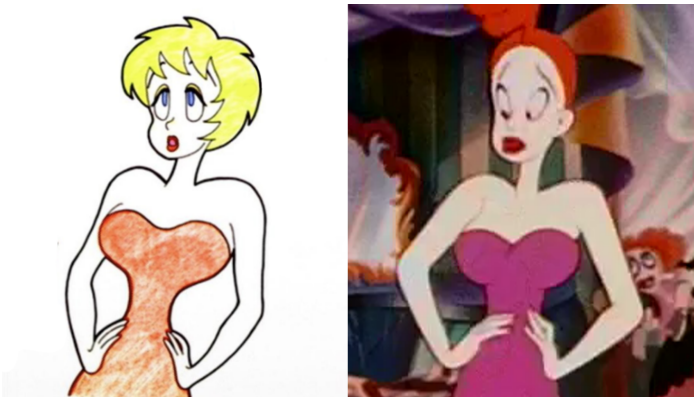
Alice in Wonderland (1951)



Sonic The Hedgehog Concept art (~1990)

Sonic The Hedgehog (1991)

However, the other human made for Sonic 1, the famously cut character Madonna. She is based on the character "Pauline" from the 1945 Donald Duck Cartoon, "*Duck Pimples*". Not only is her design influenced from the character but even her poses in the concept art are referenced off the poses from the short.



Sonic The Hedgehog Concept Art (Left)
Duck Pimples (Right)

Sonic The Hedgehog Concept Art (Left)
Duck Pimples (Right)

This short similarly to others mentioned earlier, Duck Pimples was also included in the scary short collection ディズニーのこわ~いお話.

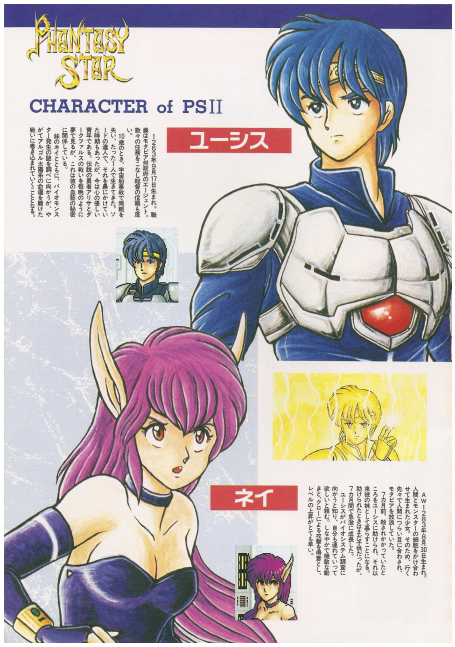
Also included in ディズニーのこわ～いお話, was the 1952 short *Trick or Treat*, which introduced the character Witch Hazel who likely inspired the face and proportions of the main antagonist of *Tails'Skypartol* Witchcart. Alongside the Evil Queen's Witch disguise in the first animated feature film, *Snow White & The Seven Dwarfs*, with her Black Robe, grey hair.

Trick or Treat (1952)	Snow White & The Seven Dwarfs (1937)	Tails' Skypatrol (1995) Sonic IDW Key art (2022)

Lastly, it is of course important to mention how important these early works where to the creation of early anime works as well which Sonic and the entire industry would be inspired by such as the "Father of Manga" Osamu Tezuka and can be visually seen in his books on how to draw manga.

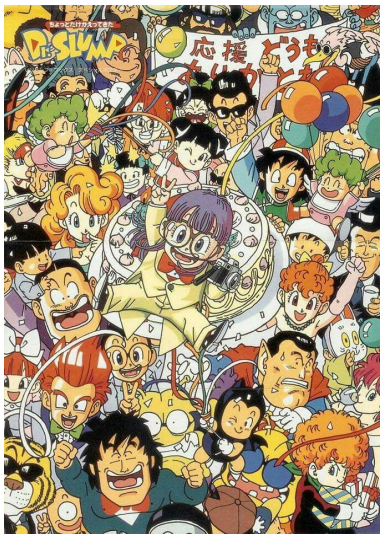
Titans of Manga

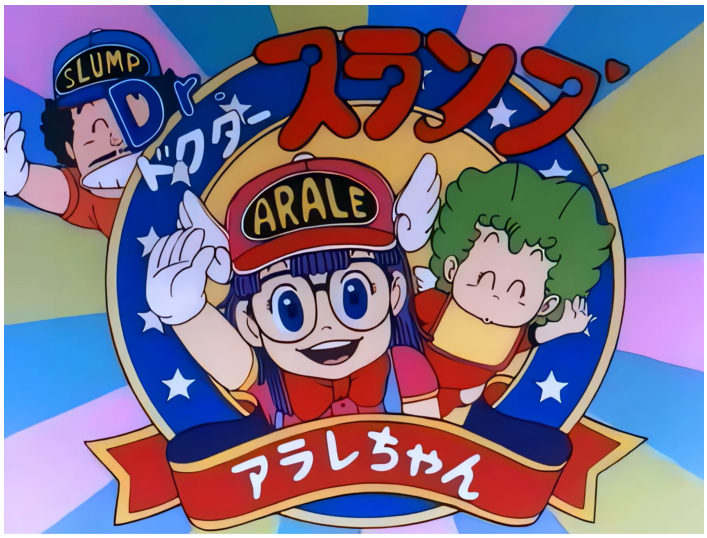
The character designs of Sonic Team's humans, when generally not referencing Lupin The Third or Yoichi Kotabe, is often very clearly inspired by Rumiko Takahashi. A lot of Rumiko Takahashi's art is very characterized by being round yet somewhat more exaggerated in the cartooning, often featuring bigger eyes and more stylized hair, heavily influenced by 80's fashion in Japan that often was wavy and curly while keeping somewhat realistic features still there. This art often emphasizes girl-like features in the characters which means they also look soft while retaining their characteristic features that communicate their personality.



Sonic Team, especially after their first few projects, started implementing this style more and more into their games, until it became nearly inseparable from their work. This style was largely adopted for almost everything they did after Phantasy Star 2 and Sonic The Hedgehog 2, largely through the influence of Yasushi Yamaguchi and Yuji Naka's personal taste being reflected more in both projects. This is especially visible in Sonic Team's early 3D work like Burning Rangers. In regards to Sonic specifically though these influences mostly are seen in eyes and hair, rather than the more realistic aspects, as can be seen in Sonic Adventure.

It is an understatement to say that Dr Slump influenced Sonic The Hedgehog. Much like many of the Japanese mascot platformers of the time, Sonic was influenced by the rising popularity of the work of Akira Toriyama. While worldwide Toriyama is more widely well known for Dragon Ball, his fame first started with Dr Slump.





Artist Yuji Uekawa has been cited to say that “Akira Toriyama’s style of deformation and lineart” heavily influenced how he approached character design whenever working for the Sonic series overall. The way Toriyama stylized human characters also worked as an inspiration for Sonic Team much like anything else from other works of the artist.
 Without Toriyama there would be no Sonic.

As time went on, Sonic Team kept evolving their style for Sonic and the world around it, and through trial and error, they landed on something that shares all unique characteristics of the previous attempts, although with more flair to it that fits alongside Sonic a bit better with clear inspirations on techniques of character design by Akira Toriyama. Characters with style in their choice of clothing that reflects their personality with unique facial features that maintained them looking cute much in a

characteristically japanese style while still having features exaggerated for comedy and stylized proportions and limbs to give a sensation of balance, much like western cartoon golden era characters.

Conclusion & Critique

In conclusion, More normal people resemble the style that defined a lot of World Masterpiece Theater animation, Studio Ghibli and 60's anime and manga with more realism and less exaggeration. Meanwhile, more exaggerated personalities often resemble a western golden era cartoon parody of themselves, much like main characters in Lupin The Third or Dr Slump.

A good way to word this out is that the more important and exaggerated the character is, the more their design reflects exaggerated designs. The same goes for more normal human characters resembling more normal looking humans, while all retaining their stylistic features to create visual appeal.

The important thing to remember is to use more classic sources for human design. All Western and most Eastern inspiration comes from the golden age time period when both sides of the globe were working with similar philosophies for cartooning and stylization. It is important to remember that all the animals and the humans should fit together even if not looking exactly the same.

Overly clashing human design was a main issue during the 2000s Sonic games on both ends of the spectrum.

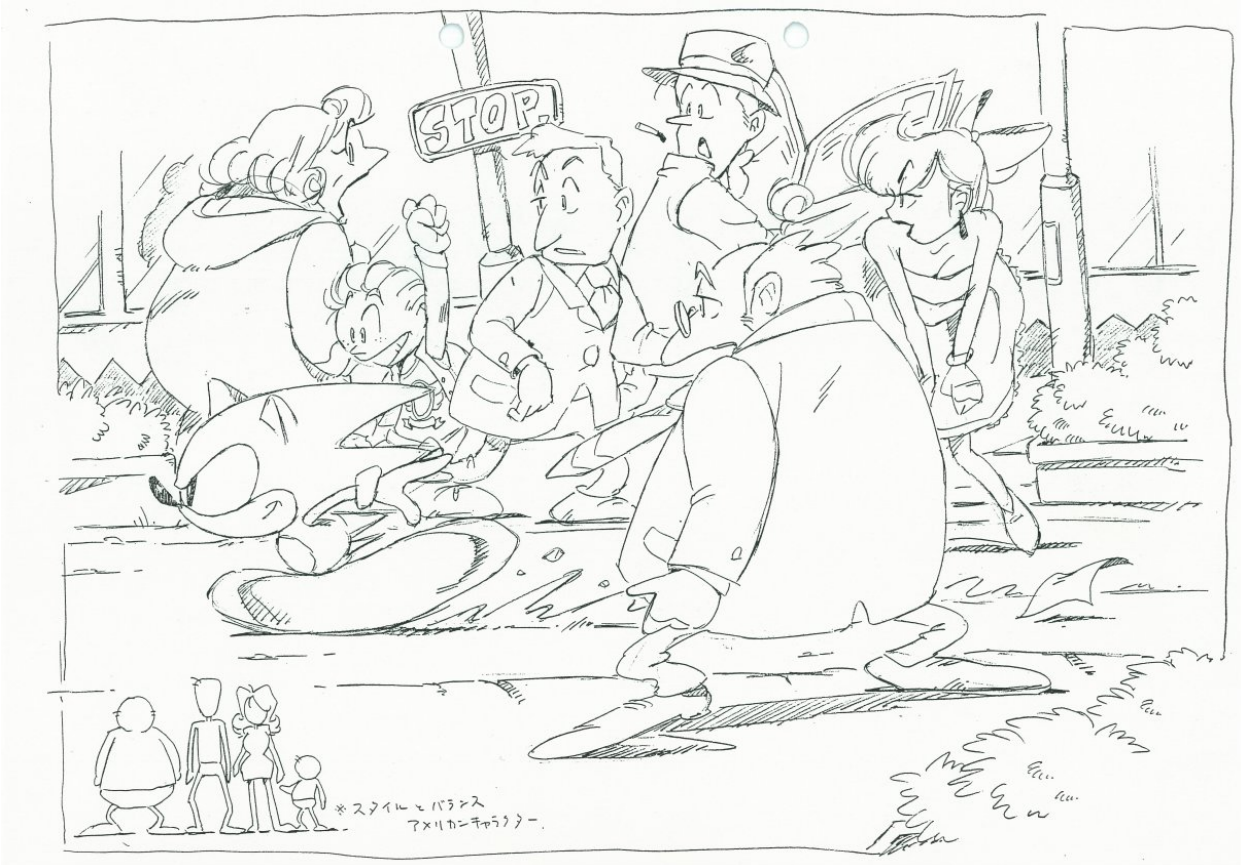
The approach from the next mainline entry *Sonic Unleashed* is equally as problematic as the one in *Sonic The Hedgehog (2006)*. trying to make the humans stylized to fit better along with Sonic and Eggman. However, their attempt to do so had some flaws. Rather than using the same style and influences for the other characters, the humans in Unleashed are

based on more modern Western CG Human stylization from around the time of game's development (2008). As such despite the humans being stylized like cartoons, they are in a completely different school of thought that makes them contrast heavily with the main cast members of the game.

It is again suggested to focus on having all the humans fit together as well as with the animal characters. Even though Eggman should standout the most in a crowd he should not look completely alien next to other humans in design. Within a consistent look there of course however can be variance. For more exaggerated personalities and or important characters it may be a good idea to have them stand out with more of a western inspired design, whilst having more down to earth characters (which commonly includes side and or background characters) being more of a simple classic anime style. This approach is what is typically used by the influences itself as well as easier games like Sonic Adventure 1 and also Sonic X.

- Not every character needs to look extremely western, but should all generally fit the more cartoony direction
- Don’t make exaggerated personalities and protagonists not be exaggerated in some form.
- Don’t make normal background characters stand out as particularly attention grabbing.
- Don’t mistake Sonic for only having a western cartoon aesthetic as it is incorrect.
- All main characters should have classic 1940s western animation influence alongside classic 1960s to 1990s anime influence.
- Don’t ever make the human characters too photorealistic as it doesn’t fit with the general art direction of the series.
- Don’t stray further from the main points of references that define what fits with the series as this can create clashing styles.

A great final example of what an idealized look for humans in Sonic could be is the concept art made for Sonic Adventure:



The general character construction is western inspired (the description on the bottom roughly translates to “Style & Balance, American Style”). With the additions of lanky limbs and bow legged stances signature to Lupin and exaggerated hair and “tareme” eyes signature of manga art like that of Rumiko Takahashi it is the most clear example of all the influences being put into a cohesive final product.

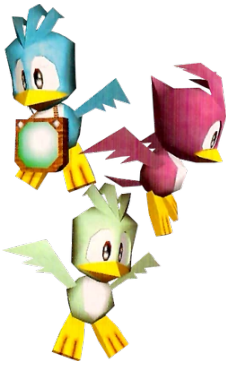
Animal Design

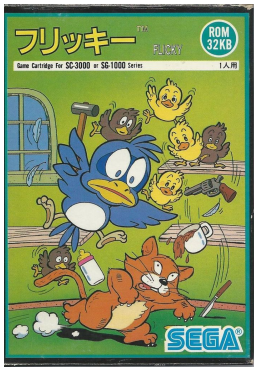
The animal friends are often portrayed in Sonic media as small animals that look innocent and uniquely different from the more humanoid characters. They look a lot more like animals and a lot more innocent. The base design for the animal friends originated from the game “Flicky”, which similarly to Sonic had character design heavily influenced by classic western animation. Flicky and the small yellow chirps are both based on Tweety Bird from Looney Tunes, while the antagonist Tiger the cat is evidently based on Tom from Tom and Jerry.

Tweety Bird
(Looney Tunes)

Tom
(Tom & Jerry)

Flicky
(1984)



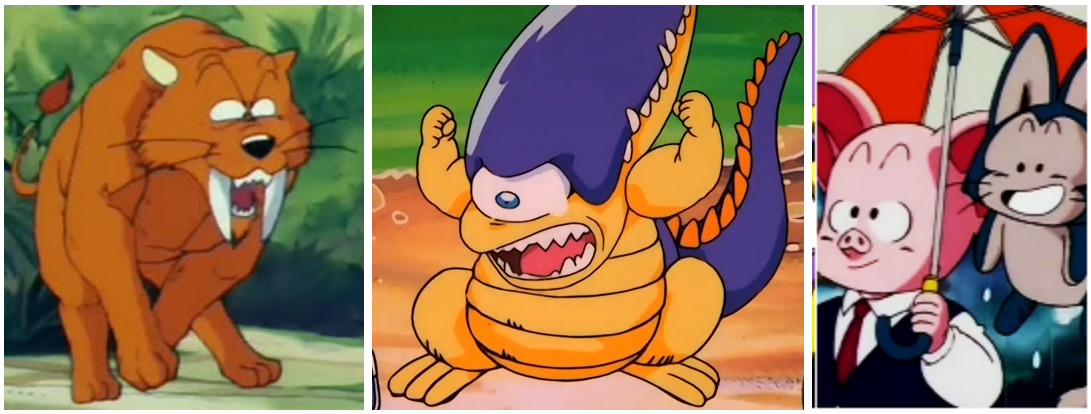


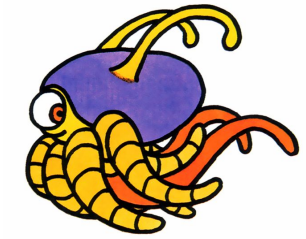
- Don't make the animals look as powerful as the main cast. Keep the animals looking more innocent, fragile and goofy. This makes the main cast stand out in comparison to them.
- Avoid anything that makes the animals look creepy and realistic instead of looking cute while being styled after the golden age of animation in the west.

Mystical Small Creature design

The design of small creatures in Sonic is rather simple. The point of reference for them is usually the same as popular chibi kodomo characters in Japanese media.

Despite these creatures often having a western classic cartoon depiction of a baby in stature and proportions, their eyes and unique character features always reflect in their design with more unique features and very deliberate usage of angles and proportions in order to give them a cute and harmless look by making them look a bit dumb on purpose.



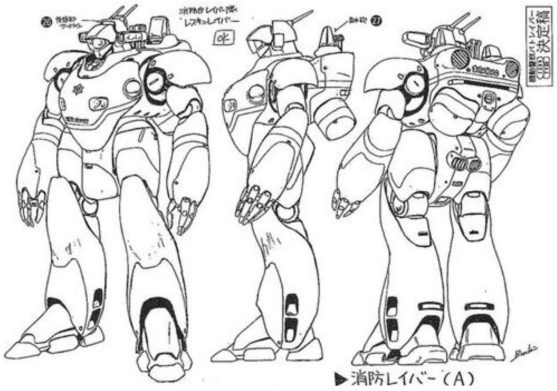


Not unlike the robots, these creatures also can have variations of these types of eyes and structure. These exaggerations are often made to convey a specific personality. Tareme eyes are more cute and innocent, while Tsurime eyes are more determined and reactive. Wide eyes with small mouths and small undetailed pupils are also always present characteristics. Defined edges and abstract shapes in specific locations help discern the character's personality as well. These characters also should never have visible eyebrows.

These characters are only westernized in body structure. Everything else should always derive from the Japanese animation media depictions of cute/moe chibi characters.

ROBOTS / BADNIKS

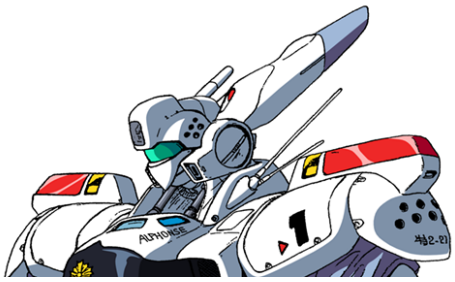
The design of the robots in Sonic The Hedgehog is highly influenced overall by Japanese pop culture around mecha's portrayal. The Sonic series takes more influence from the early era of mecha from the 70s, 80s, and 90s.

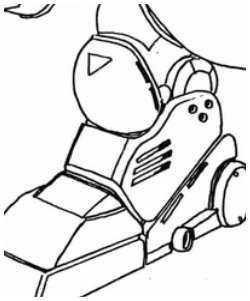


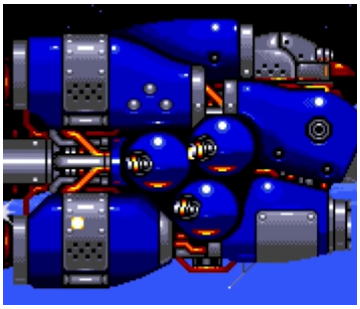
Robot / Mecha Inspiration

Three of the largest and most influential mecha franchises in Japan are *Mobile Suit Gundam*, *Mobile Police Patlabor*, and *Armored Trooper VOTOMS*. All of the aforementioned franchises were all worked on by a group of similar talented artists all having had their main anime produced by Japanese animation studio Sunrise. Making them and all the works they adapted titans of the mecha genre and the recurring design tropes they created.

Possibly most notable of all of these are using an arrangement of holes (often triangular) on mecha design, popularized by artist **Yutaka Izubuchi**.

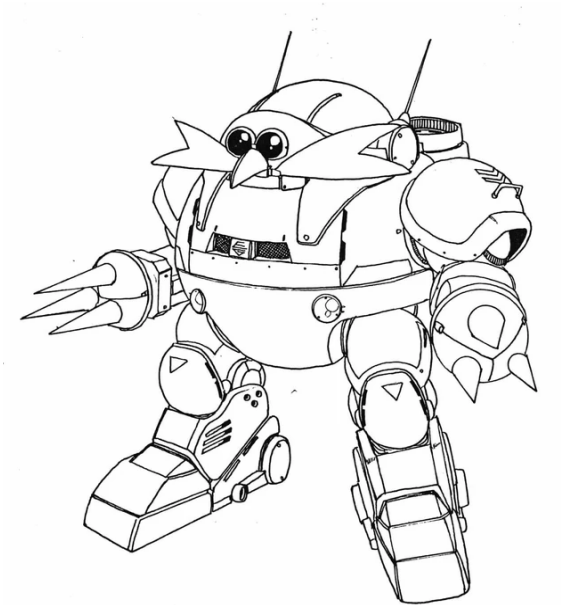






Gundam Example	Patlabor Example	Sonic The Hedgehog 2 & 3 Examples

For a more specific example, the iconic **Death Egg Robot** from *Sonic The Hedgehog 2*, has been confirmed to have *Armored Trooper VOTOMS*'s ATM-09-ST Scopedog as a key inspiration (with the Claw robot from Casshern being the other and inspiring the hands). With the most notable comparison being in the head, shoulderpads, and legs / feet.

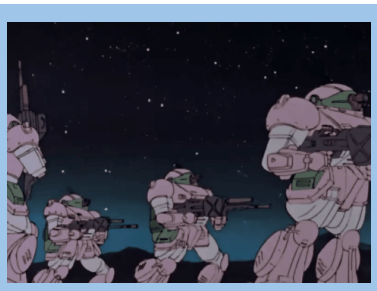


Death Egg Robot	ATM-09-ST Scopedog

Even the Death Egg Robot's distinctive landing animation is based on the way Scopedogs land in *Armored Trooper VOTOMS*.

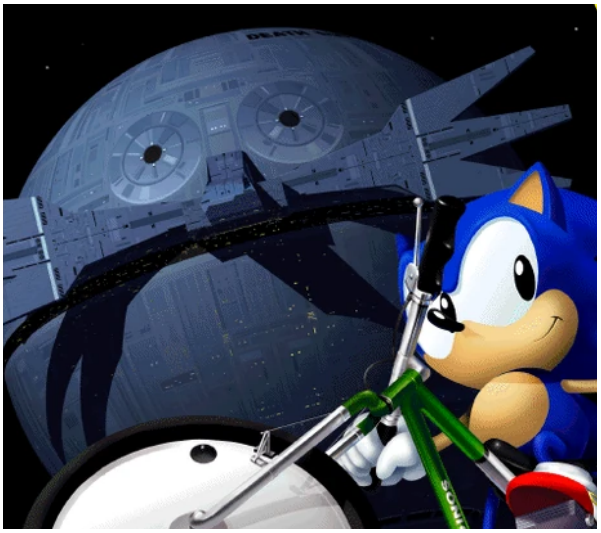
[Machine Translation]
"...It's an image of Scopedog + Casshern's claw robot adapted into Eggman's design.
I absolutely insisted to the programmer that it had to do the landing pose, and got it implemented…"

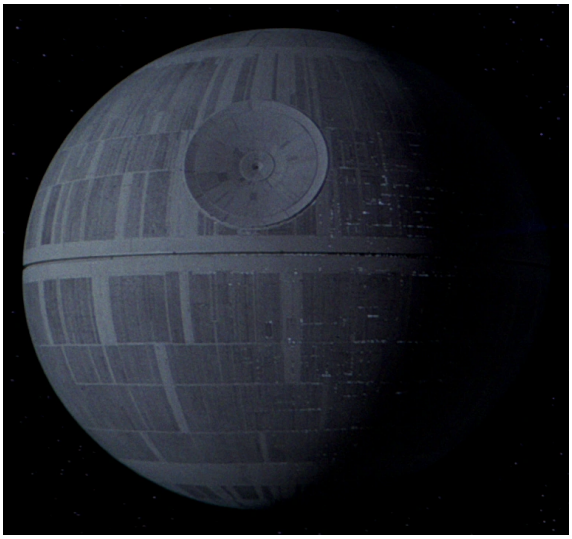
Yasushi Yamaguchi on Twitter.



Aside from Mecha anime, another large influence is sci-fi live action media. Two notable examples from the Sonic franchise influenced by live action media include the Death Egg and Mecha Sonic.

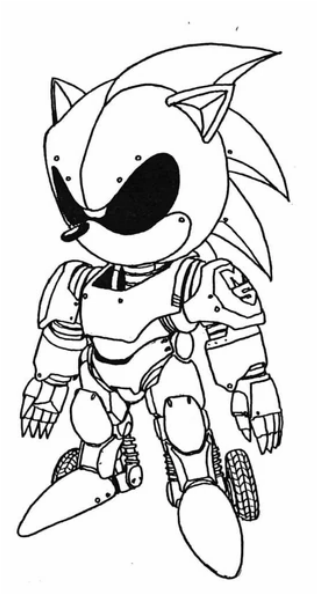
The Death Egg is of course inspired by the Death Star from *Star Wars*:





Death Egg	Death Star

And Mecha Sonic by Mecha Godzilla from the Godzilla franchise, particularly their “Showa” version in their debut film, *Godzilla vs. Mechagodzilla*. With the Buzzsaw quills on the back influenced by another Godzilla character, the alien cyborg Gigan.



Mecha Sonic	Mecha Godzilla	Gigan

Lastly, the general round, sleek and somewhat cartoony look of the common enemy robots is based both on Early CG aesthetic (gone over in detail in [2.2 - Into Silicon Dreams]) But also Robots and mecha seen in early manga. Whilst the mecha anime described earlier are more grounded and realistic in its elements, many of the earlier mecha material was a lot more unrealistic in construction, size and story. These sorts of stories fit into the sub-genre of mecha known as “Super Robots” whilst the earlier described series animated by *Sunrise* fit into the “Real Robot” sub genre.

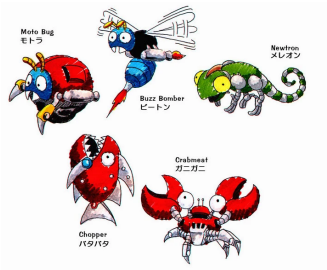
Notable “Super Robot” and general Sci-fi works from this era include Giant Robo, Mazinger Z, and Astro Boy.

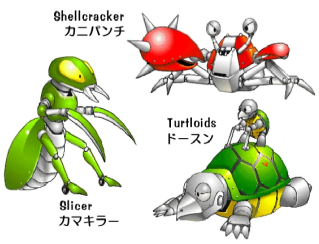
Giant Robo	Mazinger Z	Astro Boy

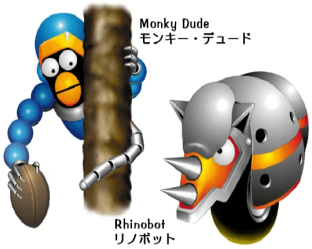
Now that a groundwork has been set for what pop culture titans created the influence and ideals, we will move onto the robots from the Sonic series itself.

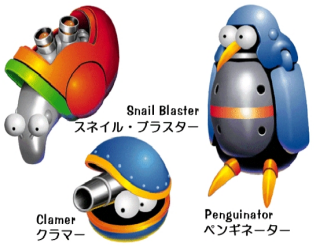
Eggman's Robots

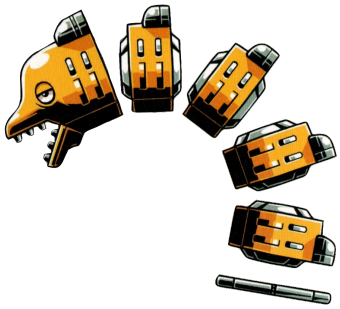
Eggman's robots often have similar mechanical parts such as combustion engines, mechanical joints, pressure switches, springlock mechanisms, metal tubes, mechanical claws and holes for the heat to dissipate. The bigger the robot, the more heat and weight it produces, which the design accounts for. The robots are not realistic, but rather fantastical creations of ""idealized"" technology.

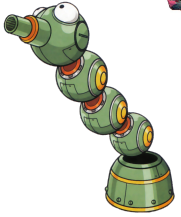








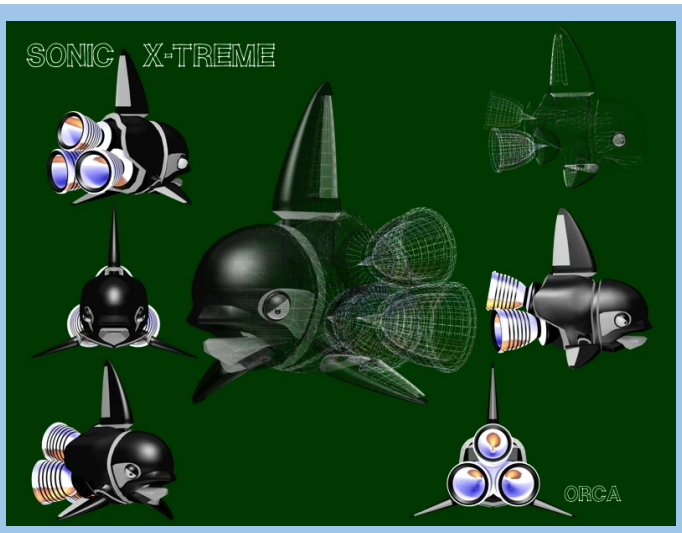




Lead artist of *Sonic X-Treme*, **Chris Senn** describes the ideals for robot design used from advice by *Sonic 3 & Knuckles*, and *Sonic Adventure* enemy artist **Satoshi Yokokawa**:

"One of the enemies I designed was the orca enemy, which basically looks like a robotic orca but with rocket engines on the back … That was loosely based on a sketch he did, because he thought - he was giving me suggestions like, "Look, if you're going to have something like a weapon, or an arm, or a head with a mouth that bites, you want to make the graphic more prominent, or the design of that part more prominent - like bigger - so you want to push to be more extreme."

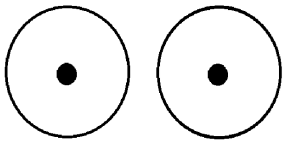
Chris Senn, Interview by Retro64 and Anonymous, hosted on SEGA Retro.



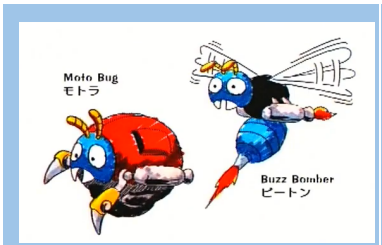
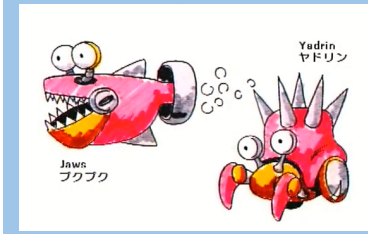
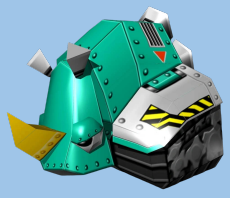
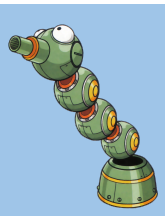
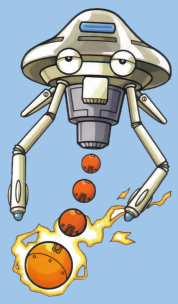
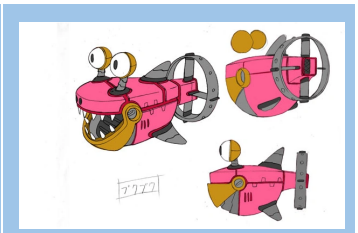
Orca enemy 3D Render from Sonic X-Treme

Based on sketch by Satoshi Yokokawa,
Design finalized by Chris Senn, 3D model by Ross Harris.

The main thing in common with Eggman's robots is how they're often shaped after animals, although with a lifeless scared looking toy look to it. No matter what version of eggman we're speaking of, that is Eggman's defining look for his robots.

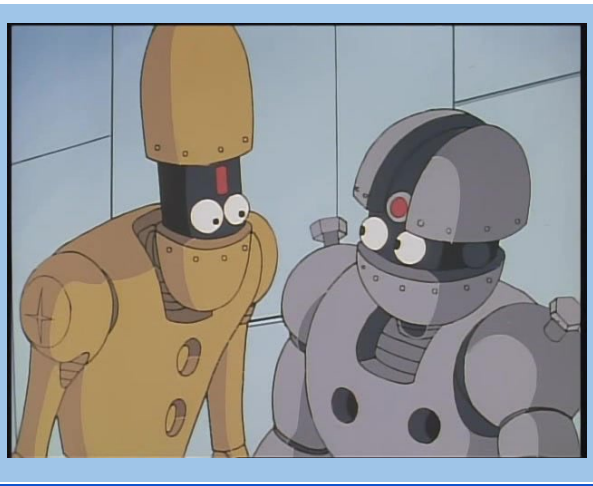
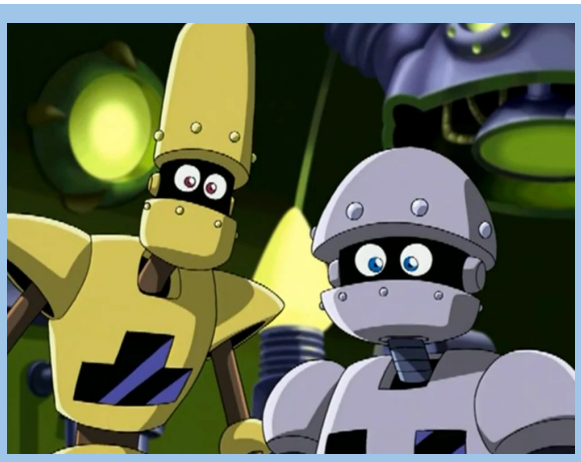


These signature eyes can be seen throughout all eras of the franchise,
From Classic, Adventure & Advance, and even Modern eras:

 		 	
Sonic The Hedgehog (1991)	Sonic Adventure (1998)	Sonic Advance 2 (2002)	Sonic 4: Episode 1 & 2 (2010-2012)

Whilst this type of eye can be found in many different types of robots in media a key one to point is The characters of Omega and Epsilon from the anime *Kinkyū Hasshin Saver Kids* which like *Lupin The Third* is created by author Monkey Punch.

They are two robots which served as heavy inspiration for Dr. Eggman's main henchmen from Sonic X, Decoe and Bocoe.

	
Omega and Epsilon (Kinkyū Hasshin Saver Kids)	Decoe and Bocoe (Sonic X)

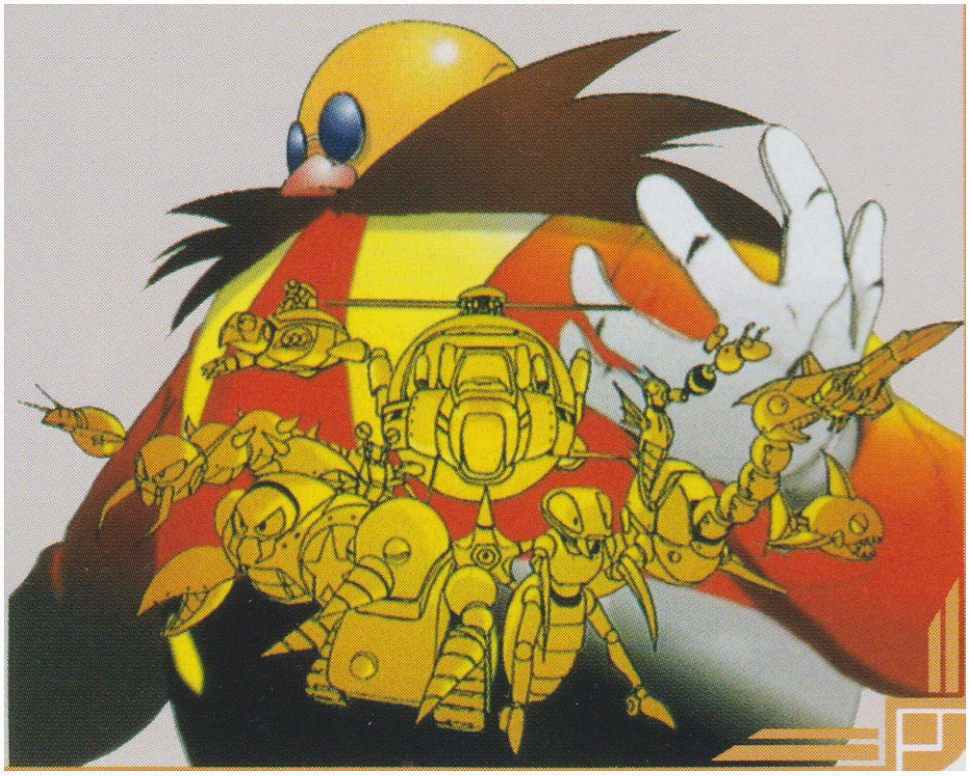
Generally these aspects of the robot designs often get misinterpreted for merely a simple baby toy look, which isn't accurate.

The robots resemble toys as much as they do robots, by having defined mechanical edges and parts.

The important thing to remember about the badniks is that although they have aspects of them that are comical, this is only due to Eggman's childish nature and immaturity. Eggman's robots are his life's work and representative of his own mind.

Whilst the robots may have toy-like features, googly eyes and a colorful robot appearance. This is contrasted by sleek designs, aspects showing complex mechanics, and sharp and otherwise dangerous looking additions to designs that make them look like a threat.

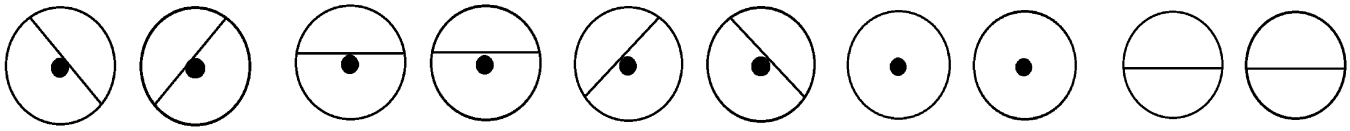
This contrast between childish and serious with the blank stares on the eyes are what gives a sense of dissonance and unease. This is all representative of course of Eggman himself who contrasts his enjoyment of childish aesthetics with his serious drastic actions.



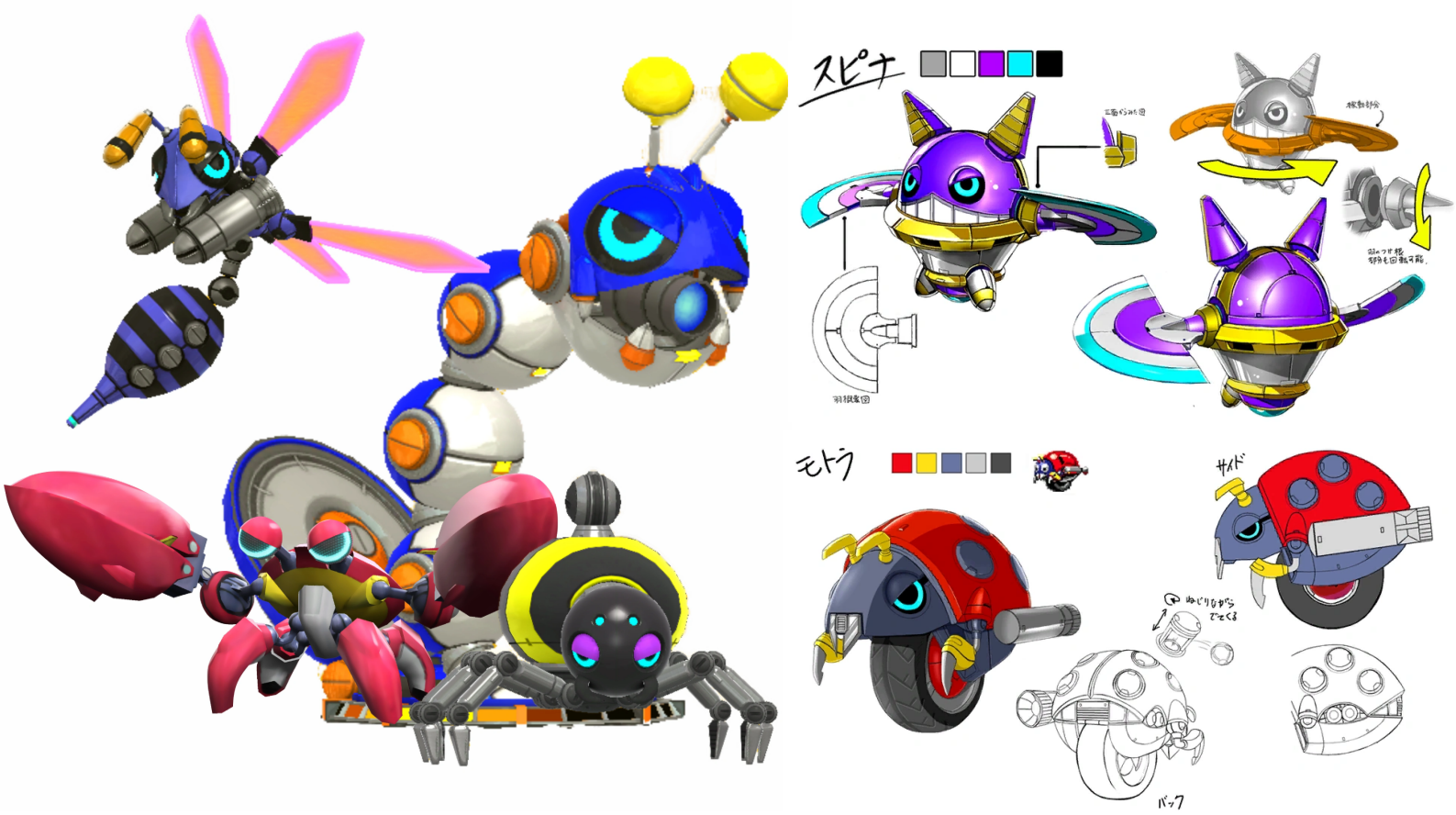
A good badnik should be able to on a dime switch between silly looking and easing and threatening.

When games like *Sonic Lost World* attempted to bring back the classic badnik designs it did so whilst not having any of the aspects that make the badniks threatening. With overall rounder designs, chibi features, softening out sharp points, lack of mechanical details and colorful focused more “alive” looking eyes the enemies in Sonic Lost World look overly friendly, nonthreatening and have an almost “baby-toy” look to them. When designing badniks it is highly recommended to avoid having features.

Regarding the eyes specifically , don’t mistake this for a lack of capacity in emoting however. In the Adventure games, Heroes,the Advance games and even in Classic Sonic (mostly within Sonic 2 & 3), the eyes change depending if the character detects a threat or not, or may have permanent eyelids baked into the design. This often is an underlooked detail.

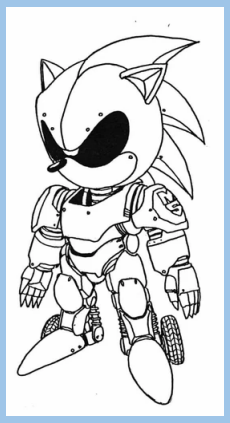


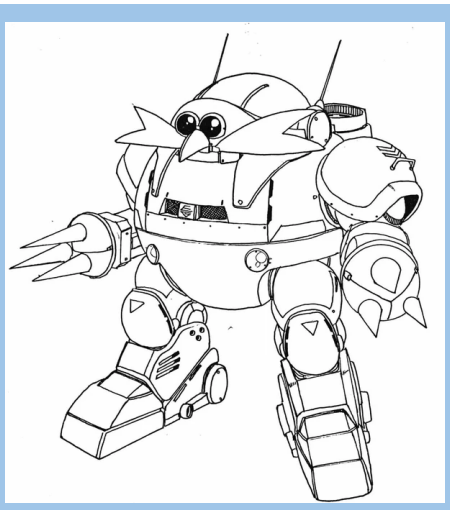
On the opposite end however, it should also be avoided by making the badniks *too* mechanical looking and losing out on a bit of that sleek “”toy-like”” shape. In most modern appearances of badniks they can be presented as overly mechanical almost to a fault with an overabundance of edges and seams and “Greebles” (A term made by *Star Wars* creator **George Lucas** to describe additional small functionless surface details on Sci-fi designs).



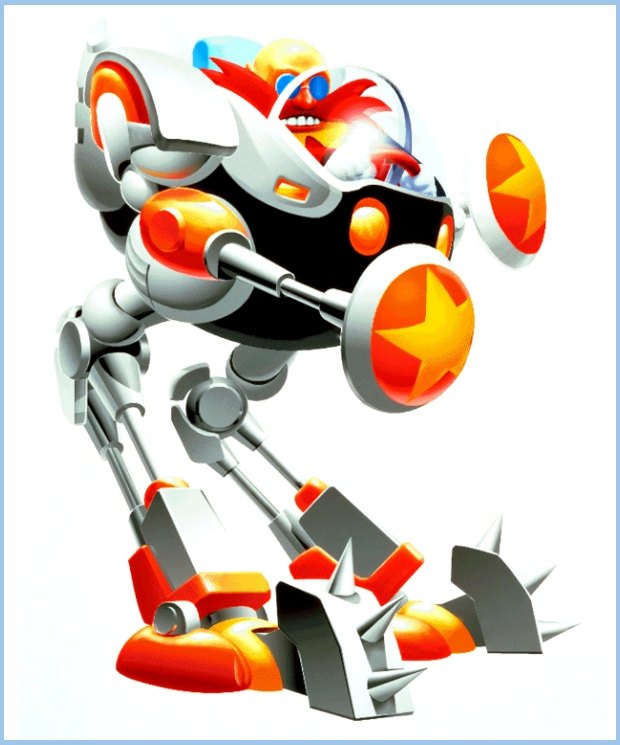
In concept these sorts of details aren’t always bad and have effectively been used in the past on larger and or more important mechanical designs such as boss robots.

Complexity can also differ based on the art direction of the game, with games like Sonic 2 having generally more complex mechanics and less "sleek" than those in Sonic CD.





Sonic The Hedgehog 2 Designs
(From Sonic 2 and Sega Harmony)



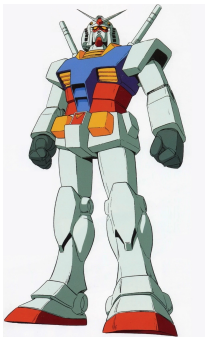
Sonic CD Designs

However, when these sorts of techniques are overused on every single robot it can start conflicting with what makes Eggman's robots unique with their sleek, CG and toy-like look for a more "standard" mecha look.

A good example for the difference in presentation of the badniks can be seen within Eggman's main two mass produced look-alike bots, Eggrobo and Eggpawn. In both designs a lot of the more simple and sleek parts of the designs have been given many different edges, lines, holes and lights or other miscellaneous greebles. Or, even outright replacing parts with much more complex pivots and joints.

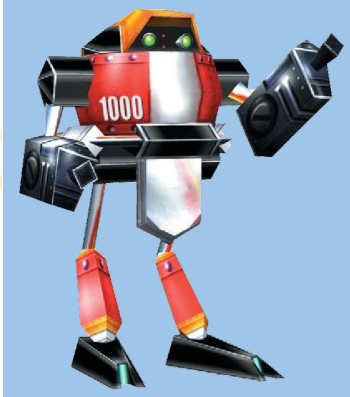
✓	≈
Eggrobo (Sonic & Knuckles)	Eggrobo (Sonic Generations)
Eggpawn (Sonic Heroes)	Eggpawn (Team Sonic Racing)

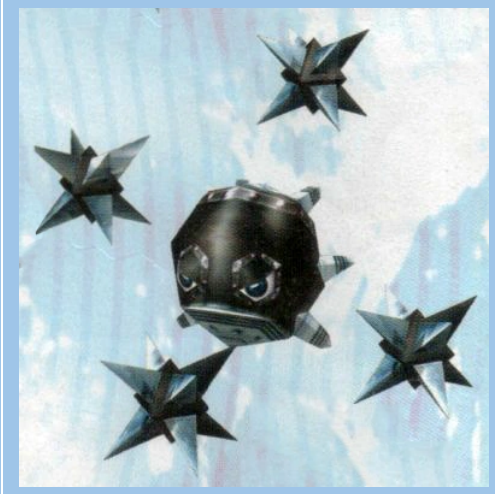
It is important to note that this presentation for Eggman's robots is so key that in Sonic Adventure 2, when mechs from outside of Eggman are seen for the first time, that being those from G.U.N. you can see the majorly different ideals in how they are made. With robots from G.U.N. being much more practical, boxy, mechanical, and militaristic taking clear inspiration from the Gundam franchise. This of course all contrasts greatly with Eggman's robots seen in the same game.



Sonic Adventure 2 Robots

G.U.N. robots / mechs

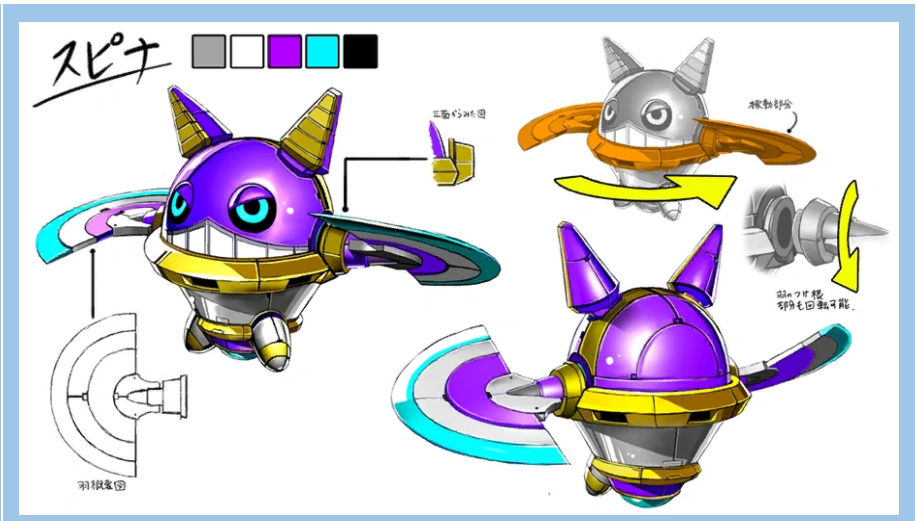




Dr. Eggman's Robots

However, due to the changes in presentation in current depictions of Eggman's badniks these lines begin to blur, lessening the impact of the contrast. Whilst noticeable in the different robots in Sonic Generations:

G.U.N. Beatle (Sonic Generations)



Spinner (Sonic Generations)

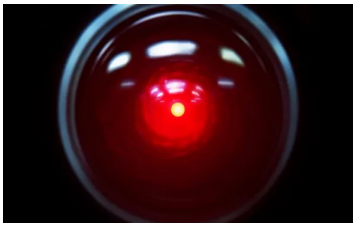
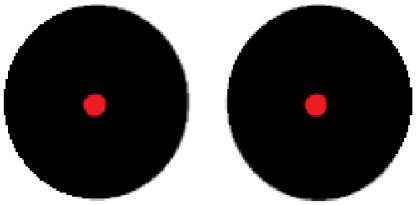
It was especially noticeable in Sonic 06, where the design quality does not look like Eggman's robots at all, more resembling 1 to 1 the types used by G.U.N.

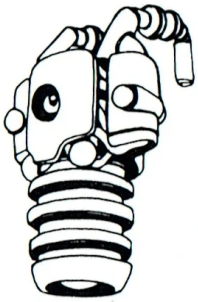
G.U.N. Hunter (Sonic Generations)

Egg Gunner (Sonic 06)

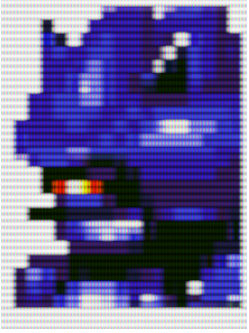
There is however a clear rule exception to how eggman robots look. Often, the more powerful robots have a distinct shiny and metallic contrast look to them, with a more uncanny alien-like appearance.

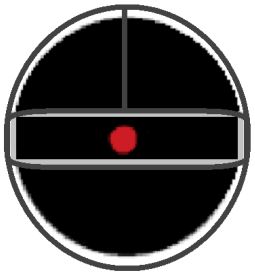
These robots draw very clear inspiration from HAL 9000 from the inflienctial sci-fi film “2001, A Space Odyssey”.



The most common variation of this shape is the helmet shape, which is still the same type of eye, although the vision of it is limited for the robot due to the shape of its head. Although, it is unknown if the LED light comes from two eyes or not, due to the lack of information. It is however more of the same types of eyes that were present elsewhere.





Another variation of it is when the pupils are overly large instead of small, as can be seen often in robots from Sonic Adventure like Gamma. The eyes in these robots often resemble camera lenses.

.

The last variation on this common spherical eye shape is what is present in Eggman's strongest robots like Metal Sonic.

Metal Sonic-like eyes are always associated with robots that can only express one emotion through what their helmet-esque brows look like, since they're made of metal, which can't bend.

The Metal Sonic-like robot eyes are conjoined and work exactly like an LED panel.

One of the main defining features of this eye shape is the circular shape. Making this shape thin makes the character look less alien and more like the main cast.

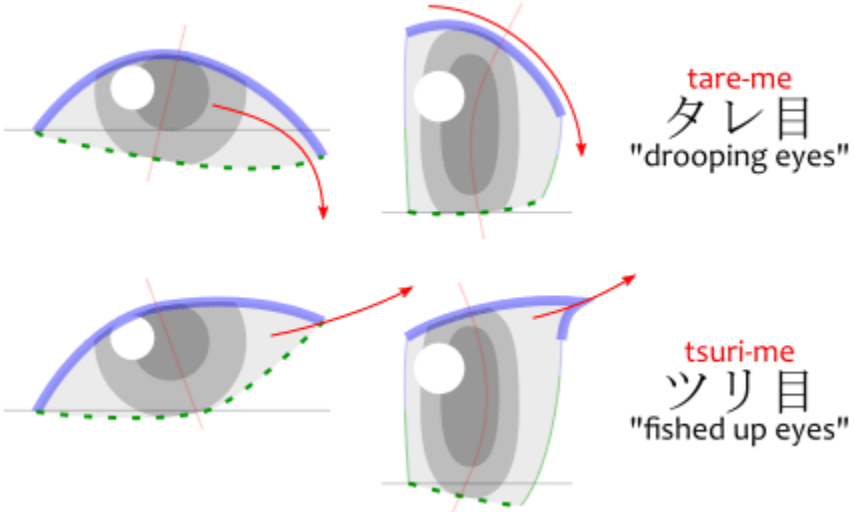
As mentioned, these types of eyes were generally reserved for more special or important robots and gave them a more imposing look.

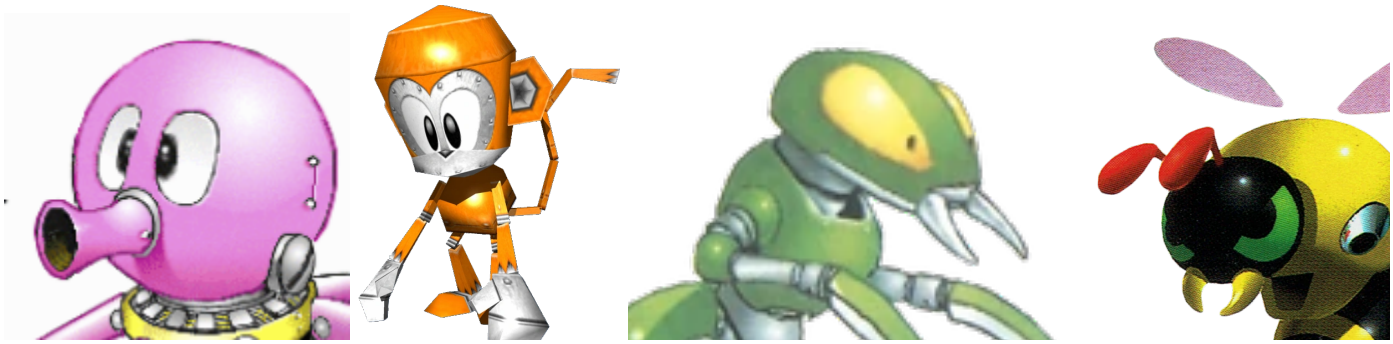
This type of eye however, was attempted to be given to modern renditions of the badniks but also mixing them with the blank eyes of prior badniks with the addition of the pupils being very large. Try to avoid these pitfalls because it makes the special robots less unique whilst also making the generic enemies look less uncanny due to the the pupil's large size

Robot Exceptions

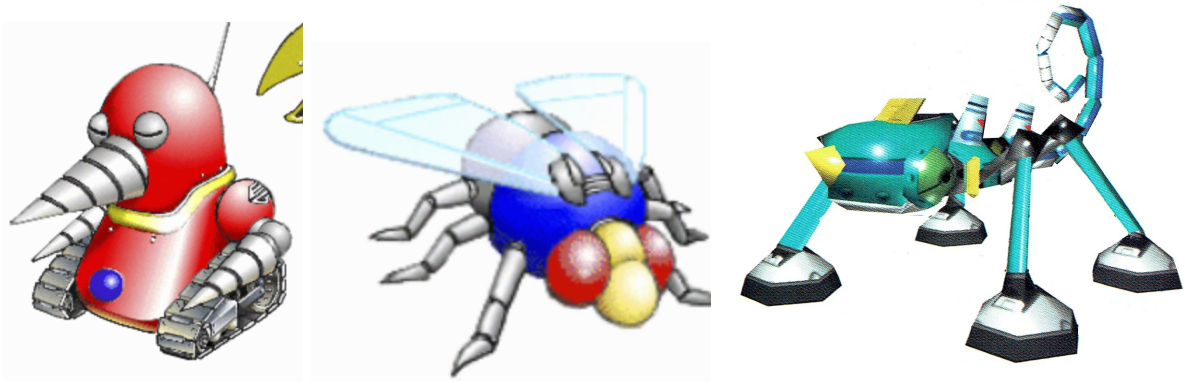
Whilst most of the series' robots follow the general guidelines listed above, there are a few outliers that give some bits of variety between the robots. Examples include:

- Any occasional robot that has Tare-me, or Tsuri-me eyes is an exception. Their eyes are uniquely shaped despite keeping the relatively small pupils.

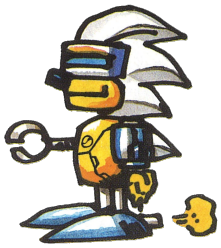
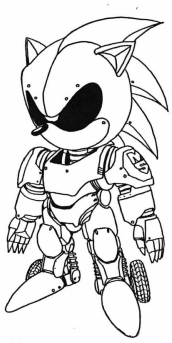


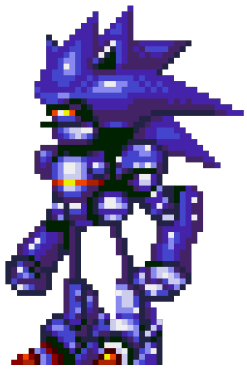


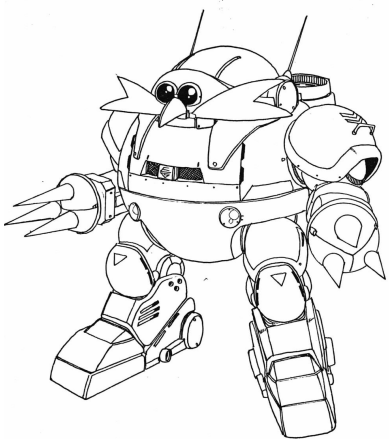
- Any robot design that wants to exaggerate how much it looks like a particular existing animal or creature in the real world.



- Mentioned “Special” robots that are supposed to be based on the appearance of a main character.





- And as mentioned any robot that doesn’t belong to Eggman, which subscribes to completely design philosophy on purpose to contrast with Eggman’s own.

METAL SONIC
THE STEEL NEMESIS

Metal Sonic was created to be a cold, alien and imposing contrast to Sonic himself with many of his design features made to be sharper, more imposing versions of Sonic's own, complete with a jet turbine to inorganically blast off at high speeds versus Sonic's natural athletic ability. With the final touch of his shiny sleek chrome appearance inspired by early CGI, Metal Sonic was created.

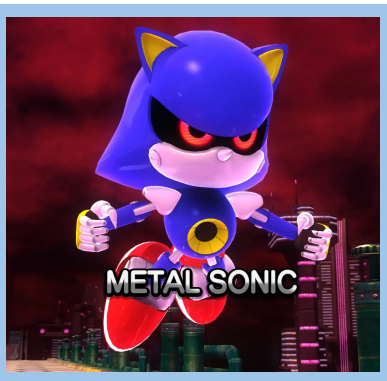
As mentioned, the key important part of his design is that he should be a menacing character. But as mentioned earlier in the Nu-Classic section, current iterations of Classic Metal Sonic have been purposefully chibi-fied making it one of the most antithetical changes to any character in the entire franchise, making him short and stubby with rounder features.

✓	✗
Knuckles Chaotix (1995)	Sonic Generations (2011)

Sonic CD & Chaotix developer Masato Nishimura more commonly known by his nickname “Mazin” had commented on Classic Metal Sonic’s new appearance when it was relevant in 2011 near the release of *Sonic Generations* stating the following. Majin can mean both Demon and God depending on how you write it in Japanese.

[Machine Translation] *“ Well, it's probably based on the model of Metal Sonic from SONIC R or something like that. The red eyes are way too big, so the eerie vibe of the original design gets completely omitted, turning it into this cute-looking design. Metal Sonic's thing is that sharp, inorganic kind of design, you know.”*

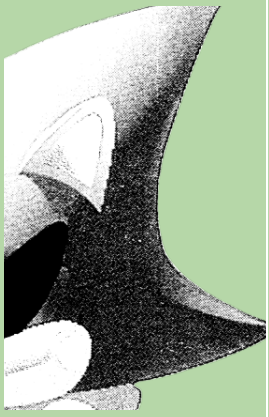
Masato Nishimura “Mazin” on Twitter.



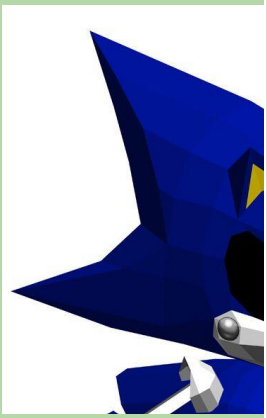
In regards to Metal Sonic feeling overly-round versus sharp a key reason for that is the way his head is constructed. Metal Sonic’s final design was supposed to have a large hard surface crease on the side of his head making his “quills” have a sharp sturdy look to them. This is an issue in both new appearances of Classic and Modern Metal. Without this detail it makes Metal Sonic’s head look like more of a flimsy toy than a solid sharp metallic surface, often made even worse with the end point of the "quills" being extremely soft and round looking rather than a sharp point.

Metal Sonic’s quills are much like a Crescent Moon.

Sonic CD Concept Art (1993)



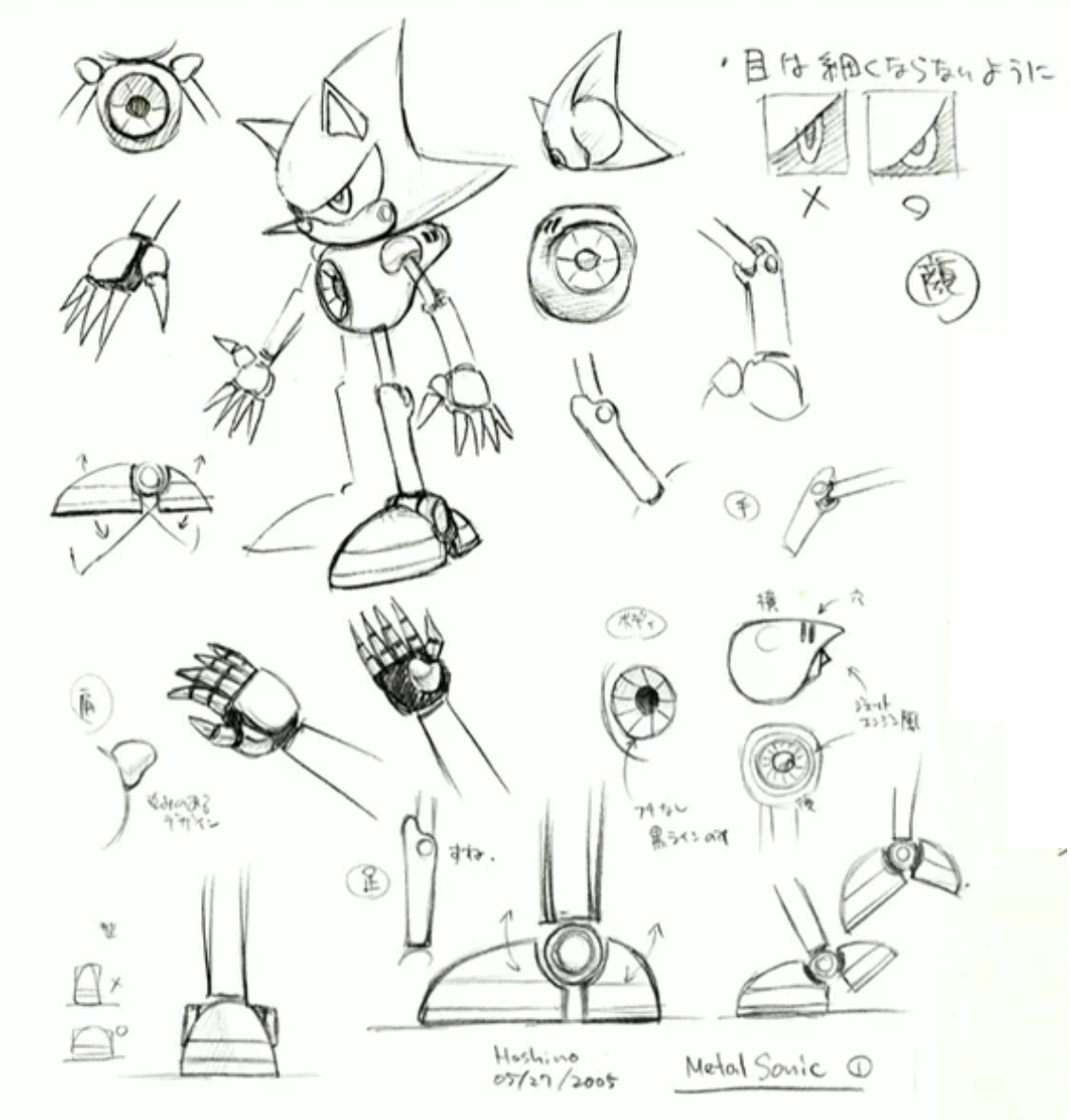
Sonic CD Key Art (Adjusted for Crease Clarity) (1993)



Sonic The Fighters (1996)

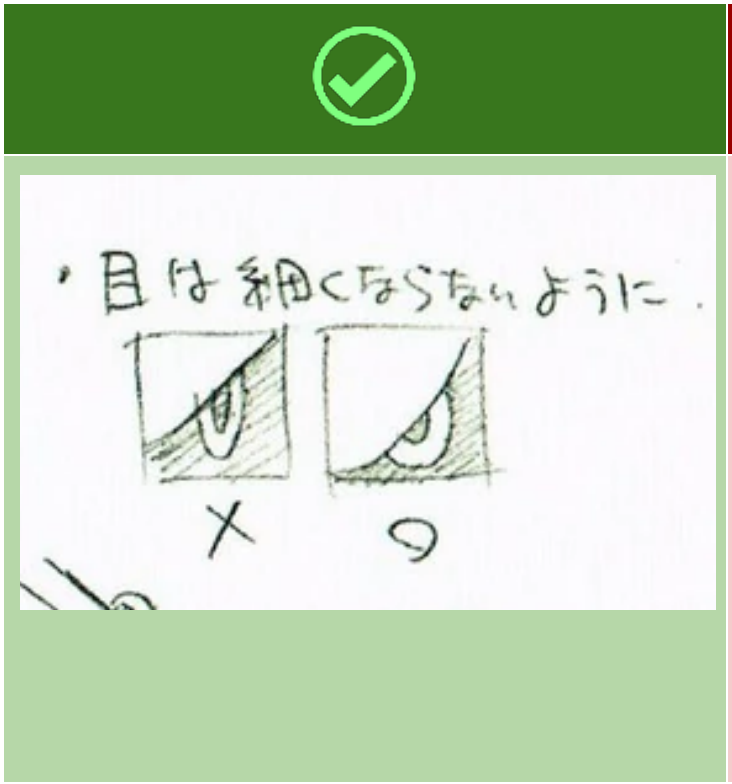
Sonic Generations, Mario & Sonic at the London 2012 Olympic Games (2011)

Moving into Modern one of the key aspects to Metal Sonic's design is his small perfect circle pupils, giving him an intense, inorganic look to his expressions. Despite this being a feature consistent across all Classic Metal designs (including current appearances), the Modern design of the character has been consistently portrayed with long oval pupils of varying width. This strangely enough is in spite of an official model sheet created by Metal Sonic's creator Kazuyuki Hoshino dated 05/27/2005 seemingly based made to be used as a reference sheet for Metal's new stock model that would debut in *Sonic Rivals 2*. With the newer shoe construction and segmented fingers from this sheet first appearing in that design.

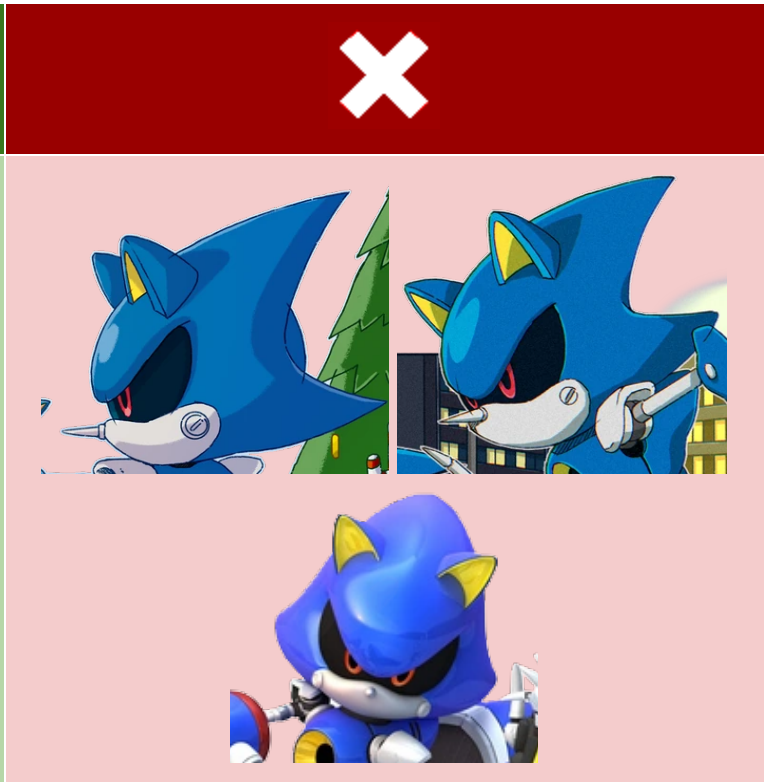


A key point of the design sheet, informs artists to not draw Metal Sonic with skinny oval pupils as well as not having the brow shape be too neutral, being one of the few official "Do and Don't" notes that exists from Sonic Team regarding character design:

Rough Translation: Make sure the eyes for Metal Sonic aren't too narrow or thin.

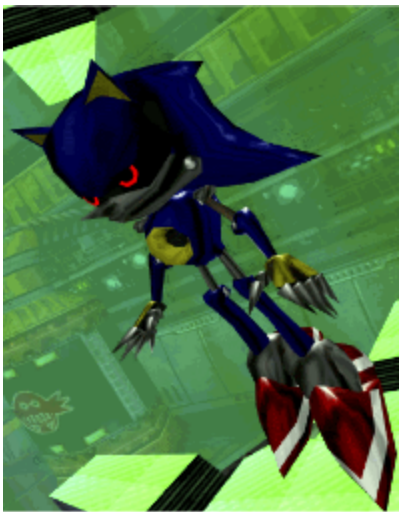


Modern Metal Concept Sheet (2005)



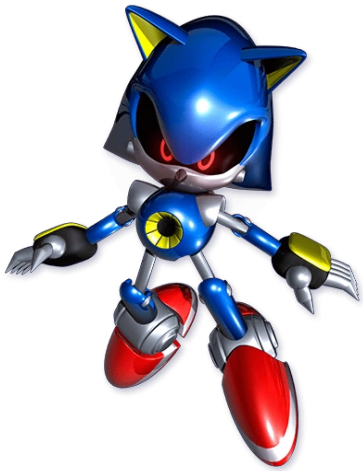
Sonic Channel Art (2021 & 2022) & Sonic & Sega All-Stars Racing (2010)

Bizarrely however, every single appearance of Modern Metal Sonic does not follow these guidelines at all, often doing both of the things the sheet advises not to do and thus makes a less intense and imposing Metal Sonic.



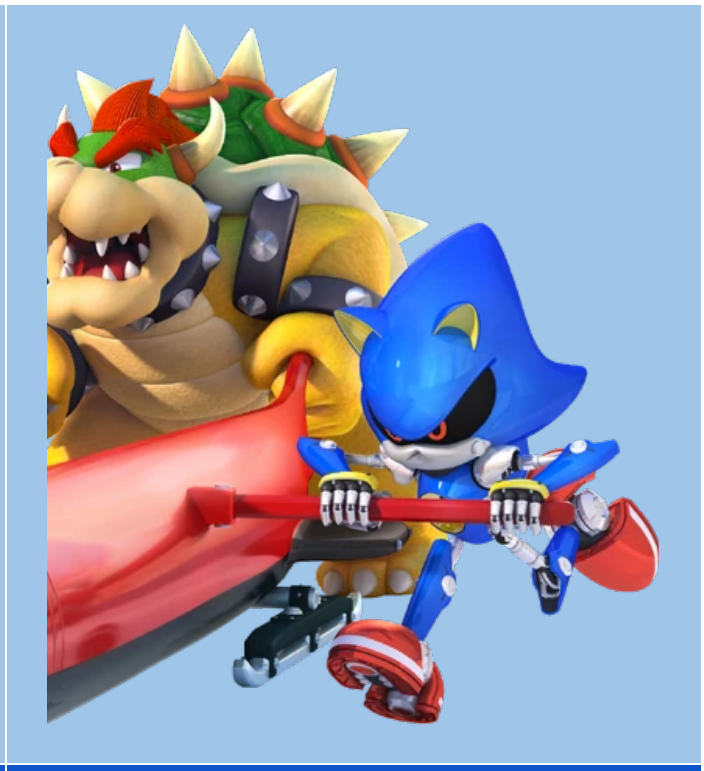
Last important thing to note with the eyes, Metal Sonic's modern style debut alongside the rest of the main characters in *Sonic Adventure* did not have long ovular eyes and had the perfect circle eyes instead. Again showing that his eyes were not originally changed as part of his "Modern" design.

Moving on, as previously mentioned a key aspect of Metal Sonic is his CGI inspired chrome look, similar to what you would see on a car with vivid color and dark metallic contrast.



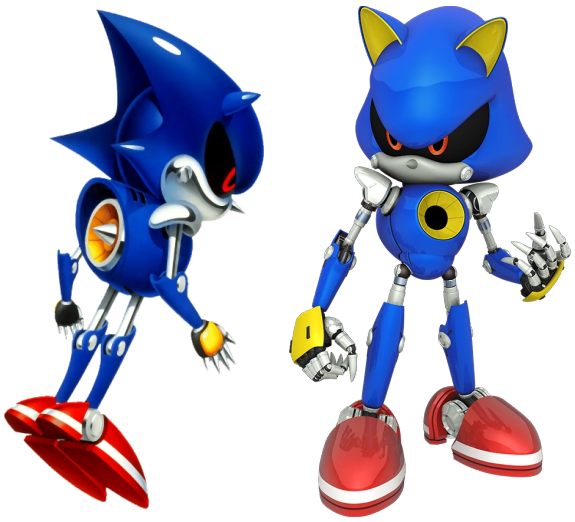
However, many current appearances of the character, both modern and classic, have portraying Metal Sonic with a low contrast plastic looking appearance with varying levels of light blue coloring, sometimes even being a lighter blue than Sonic himself for no apparent reason. The red chrome of Metal Sonic's shoes can also be seen to be lower contrast than that of Sonic's shoes as well.

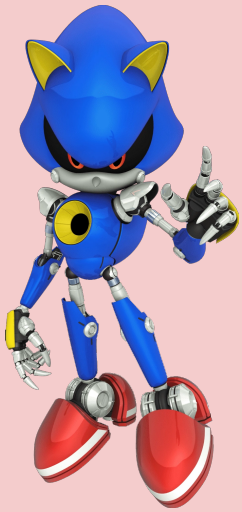
Mario & Sonic at the Sochi 2014 Olympic Winter Games (Sonic Render)



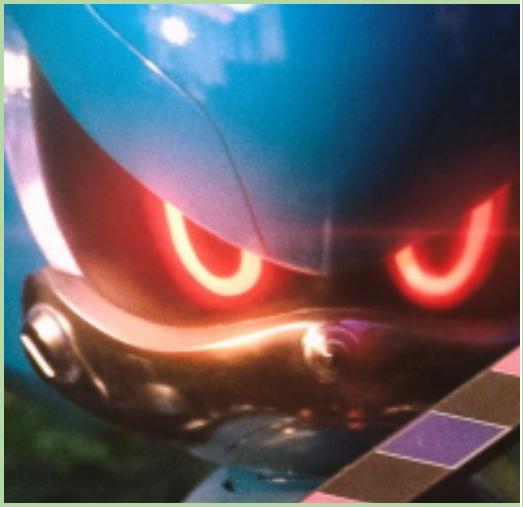
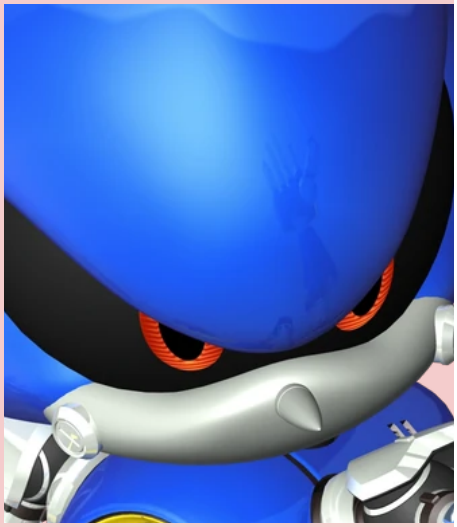
Mario & Sonic at the Sochi 2014 Olympic Winter Games (Metal Sonic Render)

This issue is especially notable in the modern stock art of Metal Sonic where his materials and texturing makes him look even less Metallic then game renders (typically by Marza), where instead of looking like Metal (Even if a light one) he instead has the appearance of a shiny greasy plastic, with the grey Metal on his muzzle looking not reflective at all and more of a matte plastic. This becomes especially notable when comparing him to older pieces of artwork. The recently released Metal Sonic Collector's Edition figure by Jakks Pacific displays how a Metallic Chrome Metal should actually look in a real life setting and ideally should be replicated for a true chrome looking Metal, true to his art from the 90s and 2000s.



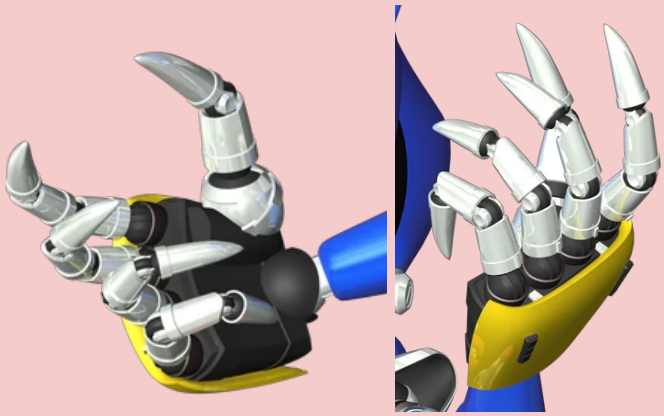
✓	✓	✓	✗
			
Metal Sonic Key Art (Sonic CD) (1993)	Metal Sonic (Sonic Rivals) (2006)	Modern Metal Sonic Collectors Edition Figure by Jakks Pacific (2026) (Photo by EL ACO on Twitter.)	Metal Sonic 3D Stock Art

Another issue with the current depictions of Modern Metal Sonic is the construction of his Muzzle. Rather than it all being modeled as a sleek hard surface it is modeled very soft looking with the bolts on the side of the face looking haphazardly applied to the sides of his face awkwardly clipping into the face then looking to structurally hold the muzzle into the face.Despite being heavily based on Modern Metal Sonic, the recently shown off preview of Movie Metal Sonic has corrected this error and this looks much more sleek and structurally sound. Despite being an issue on the Modern version of the character, this muzzle and bolt issue is not present on the current Classic version of the character.

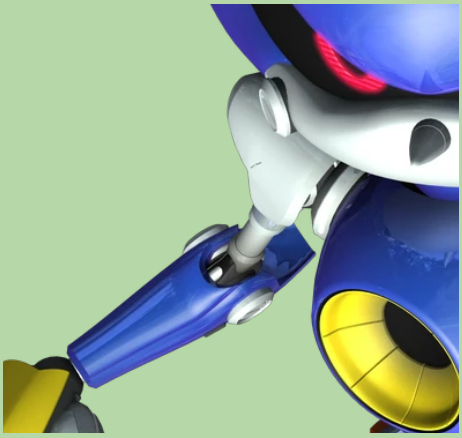
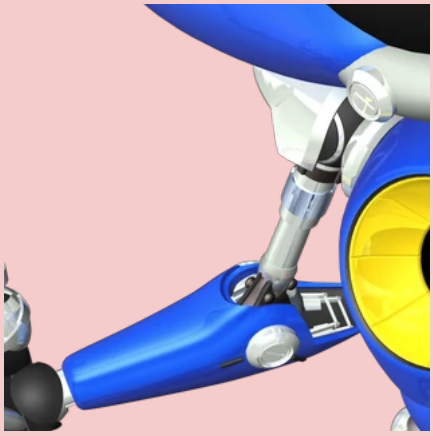
✓	✓	✗
		
Sonic Movie 4 Metal Sonic prop preview (2026)	Classic Metal Sonic (Sonic Generations) (2011)	Metal Sonic 3D Stock Art

The last important thing to note in regards to Metal Sonic is that as stated many times, he is supposed to be an extremely sleek, CGI inspired, almost alien looking design. However since Sonic Rivals 2 introduced his new stock model he has been overdetailed in some ways that detract from his sleekness, making him appear more clunky than he should, with the entire model full of lines rivets, ridges and extrusions, and other miscellaneous mechanical bits:

Notable examples include his hands:

✓	✓	✗
		
Knuckles Chaotix (1995)	Sonic Gems Collection (2005)	Metal Sonic 3D Stock Art

His arms (Which actually got more detailed over time with more inner mechanics and details around the elbow area):

✓	✗	✗
		
Sonic Gems Collection (2005)	Sonic Rivals 2 (2007)	Metal Sonic 3D Stock Art

The torso (which to note due to the extra detail and segmentation no longer resemble the intended look of a turbine. Sonic Adventure 1 had kept this simple turbine shape whilst also making it taper at the bottom to resemble Sonic's own redesign):

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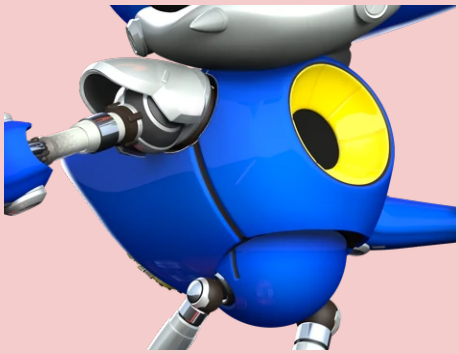
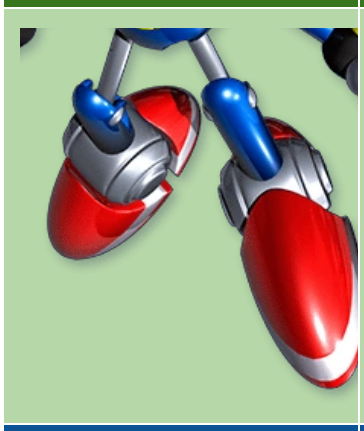
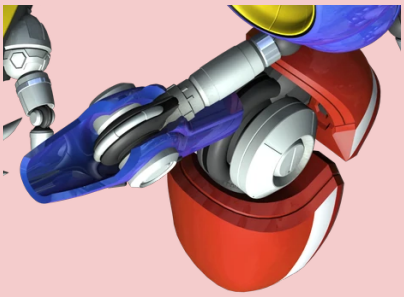
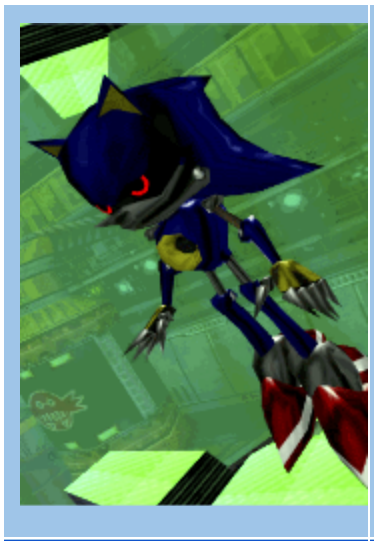
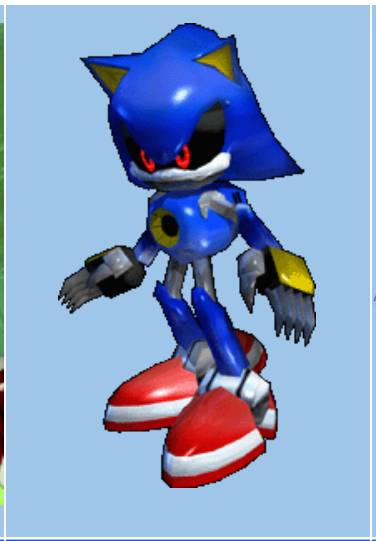
			
Sonic Rivals (2006)	Sonic Adventure (1998)	Sonic Gems Collection (2005)	Mario & Sonic at the London 2012 Olympic Games (2011)

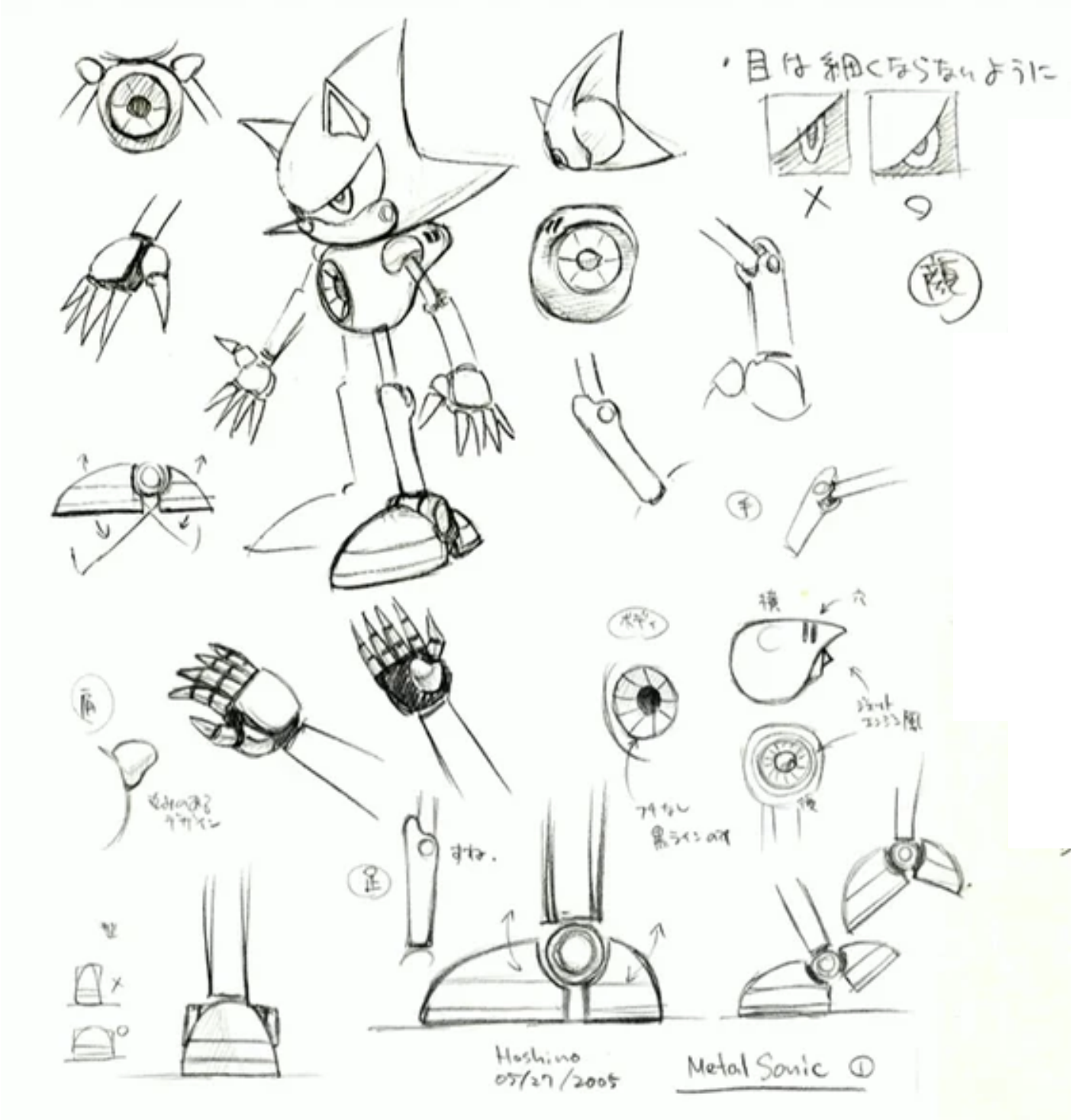
And his Legs & Feet:

✓	✓	✗
		
Sonic Rivals (2006)	Sonic Gems Collection (2005)	Metal Sonic 3D Stock Art

Whilst none of these details are poorly made and fine in a vacuum they do not fit the intended sleek, futuristic look that defines the character. It is of course also important to note that these features were not originally made for his modern design to begin with, with Modern Metal Sonic from Adventure 1 to Sonic Gems Collection having none of these extra details, instead being a taller lankier version of his original design to be inline with the rest of the modern cast.

			
Sonic Adventure (1998)	Sonic Adventure 2 (2001)	Sonic Rivals (2006)	Sonic Gems Collection (2005)

And also the Modern Metal design sheet by Hoshino in 2005, which as a whole is the best reference for what Modern Metal would ideally look like being a direct evolution of his design into the modern style by his creator himself whilst still keeping true to his classic design.



Conclusion

Good art is defined by knowledge. Knowledge is defined by research. This document's main goal was to explain what makes Sonic and what makes its visuals special, but also to help give insight on its creation and techniques to help readers grow as artists. Don't stop at Sonic. The franchise is only as strong as it is because of its wide rich inspiration pool. Sonic is fantastic, but great artists (such as those at Sonic Team) study way more than just video games as seen time and time again throughout this document. We hope that this document can be used as a launchpad to encourage growing your knowledge outside of the Hedgehog himself. You'll find the more you grow, the more you'll improve.
Always keep on Creating. Always keep on Learning. Always keep on Running.

"Don't just sit there and waste your
precious time. When you want to do something, do it right away.
Do it when you can. It's the only way to live a life without regrets."

Thank you for reading, you are the best!
- Azure Comet Collective